

# Wildlife Conservation Society

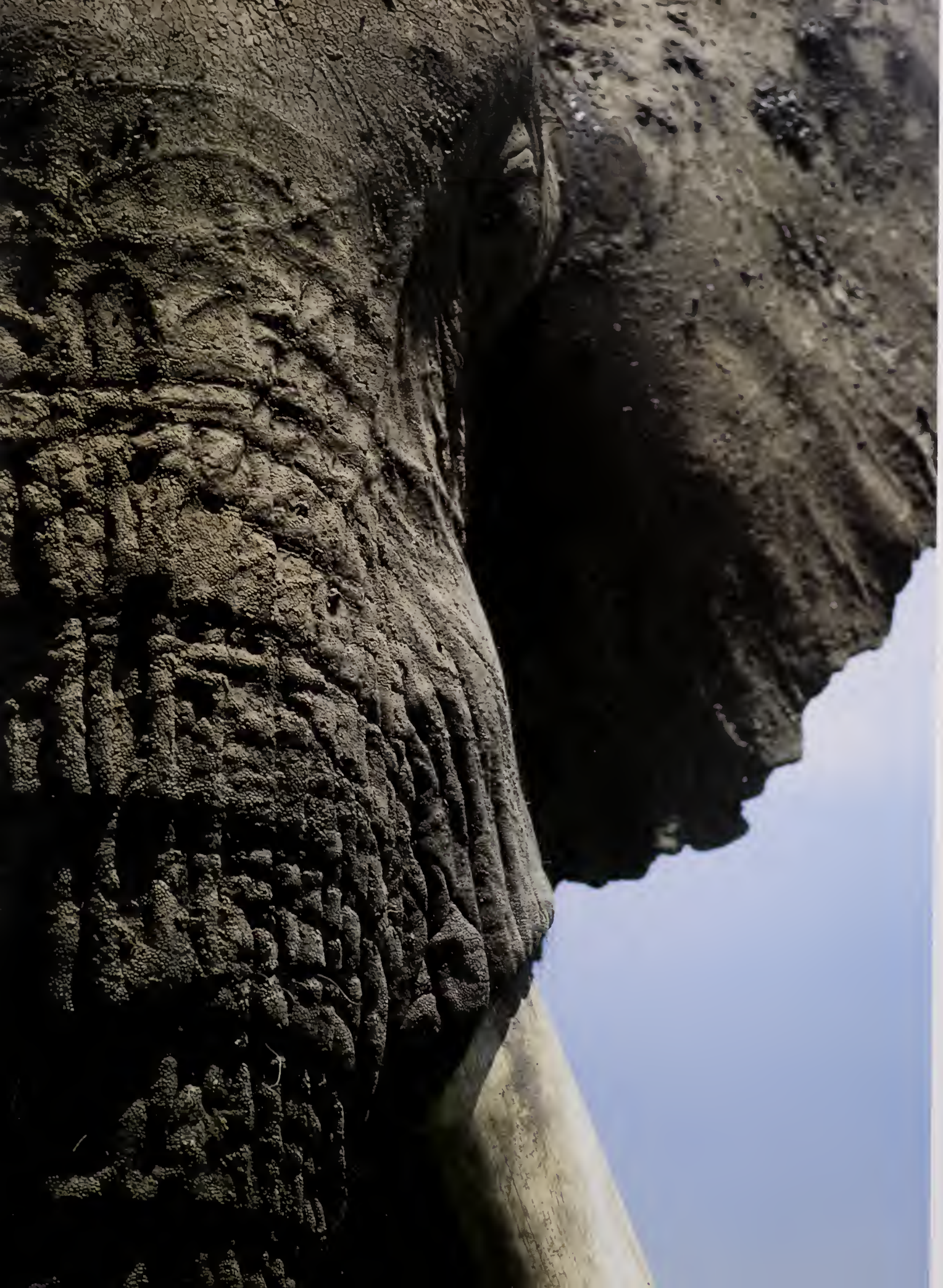
*Annual Report 1996*



**WILDLIFE CONSERVATION SOCIETY**  
FOUNDED IN 1895 AS THE NEW YORK ZOOLOGICAL SOCIETY

*to sustain biological diversity ♦ to teach ecology ♦ to inspire care*

The purpose of the Wildlife Conservation Society, since its founding in 1895 as the New York Zoological Society, has been to save wildlife and inspire people to care about our natural heritage. Today, 101 years later, that purpose is achieved through the nation's largest system of urban zoos (the Bronx Zoo, the Aquarium for Wildlife Conservation, and the Wildlife Centers in Central Park, Queens, and Prospect Park), pioneering environmental education programs used in 48 states and several nations, and the world's leading international conservation program devoted to saving endangered species and ecosystems. We are working to make future generations inheritors, not just survivors.



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*Participants in the Society's centennial safari, "Footseps Across Africa," enjoy the view of Kenya from a hot-air balloon.*

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*The City of New York, through its Department of Cultural Affairs, provides part of the annual operating support for the Bronx Zoo/Wildlife Conservation Park and the Aquarium for Wildlife Conservation, both of which occupy City-owned buildings on City-owned property.*

*The Wildlife Conservation Society administers the Central Park, Queens, and Prospect Park Wildlife Centers for the City's Department of Parks and Recreation, which provides annual operating support for the Centers.*

*The Society also receives annual funds from the Natural Heritage Trust, a program of the New York State Office of Parks and Recreation.*

COVER: MONARCH BUTTERFLY.  
BACK COVER: SCHOOLCHILDREN VISIT THE BUTTERFLY ZONE AT THE BRONX ZOO.

*In our 101 years,* the Wildlife Conservation Society has had nine volunteer leaders—presidents and chairmen of the board. None has more to show for his tenure than Howard Phipps, Jr., who stepped down as chairman of the board of trustees in April 1996 after 21 years of unprecedented accomplishment. These accomplishments are remarkable, and I would like to note them for the record.

Howard Phipps, Jr., as president from 1975 to 1993 and chairman until 1996, presided over a virtual renaissance of New York City's public zoo and aquarium facilities. The Bronx Zoo was transformed into a modern wildlife conservation park with the creation of Wild

Asia, the new Children's Zoo, the Carter Giraffe Building, the Wildlife Health Center, JungleWorld, Himalayan Highlands, the Keith W. Johnson Zoo Center, and Baboon Reserve, culminating with the groundbreaking for Congo Gorilla Forest. The revitalized Aquarium has added the Shark Tank, the Marine Mammal Holding Facility, Discovery Cove, and Sea Cliffs. And most miraculously, as a result of negotiations with the City in 1980, the Society designed three new wildlife centers to replace the old City zoos in Central Park, Queens, and Prospect Park.

At these five centers in four boroughs, WCS now enthralls and educates an annual audience of more than four million people, from the City, the suburbs, the nation, and the world. Education programs reach nearly two million schoolchildren in all the school districts of metropolitan New York. And far beyond our tri-state borders, these programs are used by teachers and students in nearly every state and several nations, from China to Kenya. Our international field conservation program stretches even farther, with projects in every corner of the globe. These are definitely developments of the last two decades, and much credit goes to Chairman Phipps.

As Chairman Emeritus, he will remain a guiding star for the rest of us. This past year was really his, anyway. He hosted the groundbreaking for the Congo Gorilla Forest on October 18, 1995, and presided over his last annual meeting at Avery Fisher Hall on April 22, 1996, which closed our centennial year and brought the \$100-million Wildlife Crisis Campaign, in which he played a key role, to a successful conclusion (see pages 46-51). In between, from February 16 to 29, he led several groups of inrepid trustees and support-

ers to Kenya and Tanzania for "Footsteps Across Africa," again celebrating our centennial (see page 57). These safaris raised another \$230,000 for WCS international programs.

Finally, we were able to pay tribute to Howdy at Gala 101, which was attended by nearly 1,000 guests under a big tent at the Bronx Zoo on the evening of June 11, 1996. The Gala was co-chaired by Charles and Norma Dana and Eben Pyne. The Danas and the Charles R. Dana Foundation helped fund the event, which raised more than \$1 million for the Society. Serving as volunteer editor, Advisor Elizabeth S. Groves produced a colorful and historically vivid journal for Gala 101, with many wonderful tributes to Howdy's leadership.

Our centennial year was gratifying in support that was elicited for the Society. Membership rose by 18 percent to a record of 62,975. Gifts and pledges from individuals, foundations, and corporations, and including membership and bequests, totaled \$20,479,204. The Wallace Fund, established by *Readers Digest* founders DeWitt and Lila Acheson Wallace, provided major backing for projects at the World of Birds, designs for the new Children's Zoo in Central Park, planting and reforestation at the Bronx Zoo, improvements and education at the Central Park Wildlife Center, the growing programs of the Science Resource Center, and of the Exhibition and Graphic Arts Department. Trustee Julian H. Robertson gave to operating revenues, as did Howard Phipps, Jr. The Edward John Noble Foundation and St. Catherines Island Foundation continued their outstanding support of the Wildlife Survival Center, thanks to the efforts of Trustee Frank Y. Larkin

and Advisor Bradford D. Smith. A new and very helpful source of funds is Earth Share, of which WCS became a member this year, joining other leading environmental and conservation groups as recipients of corporate and government employee contributions.

In the Wildlife Crisis Campaign, chaired so ably by Trustee Dailey Pattee, the Congo Gorilla Forest received several major contributions, complementing the more than \$10 million pledged by the Mayor's Office, the City Council, and the Bronx Borough President. Among these private donors were the Starr Foundation, the Cleveland Dodge Foundation, the Sally & Julius Smolen Foundation, the Chase Manhattan Bank, Bristol-Myers Squibb, Leonard and Allison Stern, George Hecht, Hillside Capital and the Irwin Family, the Barker Welfare Foundation, William Flaherty, and Bradley Goldberg. Other capital donors included the Robert W. Wilson Foundation for the Wildlife Crisis Fund, backing international field projects, Edith McBean Newberry for Saving Tropical Forests, and Mr. and Mrs. Thomas Unterberg for the Field Veterinary Program.

International field programs received grants from several major sources. The John D. and Catherine T. MacArthur Foundation and Liz Claiborne and Art Ortenberg Foundation continued their extremely active support for projects in Africa, Asia, and Latin America. In Africa, the Walt Disney Company Foundation, the Robert Wood Johnson 1962 Charitable Trust, and Mr. and Mrs. Joseph Cullman were behind several important efforts. Latin American projects were also backed by the Global Environmental Facility of the United Nations Development Programme and a number of local organizations. Funding for Asian projects came from MCG HealthCare and its "Hold That Tiger Campaign," the L.X. Bosack and B.M. Kruger Foundation, the Gilbert and Ildiko Butler Foundation, and the Armand G. Erpf Fund. The Geraldine R. Dodge Foundation, the Geoffrey Hughes Foundation, and others helped expand initiatives in North America.

The Society's Wildlife Health Sciences Department received outstanding support, particularly for its Field Veterinary Program, from the Schiff Family, Dr. Judith Sulzberger, Caroline Sidnam, and Pamela and Renke Thye. And the Education Program was aided by grants from the Charles Zarkin Memorial Foundation and the Geraldine R. Dodge Foundation, among others.

Leadership in the fund-raising and planning processes was provided by several dedicated committees of board members and supporters. Chairing these committees were Craig Taylor, Aquarium Marketing and Support; S.A. Ibrahim, Business; Dailey Pattee, Centennial and National Wildlife Crisis Campaign; John Pierrepont, Conservation; Anthony D. Marshall, Education and Exhibition; John Elliott, Jr., Marketing and Communications; Mrs. Thomas Unterberg, Wildlife Health and Sciences; Meaghan Dowling, Charles Howard, and Charles W. Russell, Jr., Conservation Council; and John D. Goldman and Helen M. Spalding, Northern California Council.

Four new Trustees joined the Society's Board. William E. Flaherty is Chairman of Horsehead Industries and provided outstand-



*David T. Schiff*

**CHAIRMAN OF THE BOARD OF TRUSTEES**

ing support for the Wildlife Crisis Campaign. Judson C. Green is President of Walt Disney Attractions with an abiding interest in wildlife conservation. Joyce Moss, an Advisor since 1985, has been active in many WCS projects, most recently in establishing, with Anthony D. Marshall, the Society's new Web site. George Phipps, a venture capitalist, was named an Advisor in 1993 and has been a prime mover in the Conservation Council. Three new Advisors were appointed. Stage and screen actress Glenn Close has given generously of her support, time, and talent since 1986. Anne Gilchrist Gleacher has focused on the Society's Wildlife Health programs. And William B. Lloyd has a special dedication to the Society's field work in Zambia.

Finally, WCS is fortunate to begin its 102nd year with a uniquely diverse international staff under William Conway, whose pioneering work over the past 40 years with Howard Phipps, Jr., Robert Goellet, Laurance Rockefeller, and Fairfield Osborn has been unparalleled. Without the efforts of the Wildlife Conservation Society, and those of like-minded organizations, what kind of life would there be for future generations? Our hopes lie in reaching ever increasing numbers of children and young adults, whose support and encouragement will be crucial in the years to come.

# *I have just read* the annual reports of fourteen large insurance, electronics, oil, and pharmaceuticals companies. All had "extraordinary years" (one was extraordinarily bad). All discussed service, growth, competition, financial outlook, returns on investment, and business strategies. Instructively, the insurance enterprise disclosed its strategy for catastrophe management—determine where catastrophes are likely to occur and avoid providing service there. For the Wildlife Conservation Society, there was many a lesson.

The "bottom lines" of these corporations were impressive. By comparison, the Society's bottom line is minuscule. (Although WCS members may note that EXXON is working in only 29 countries, while WCS is working in 53—but EXXON probably isn't worried.) Even our

deficits seem child-size, but it is thought-provoking that so many captains of those commercial enterprises donate time to conservation and to WCS's committees and its boards of trustees and advisors. Why do they do it?

In a broad sense, they are rewarded for the personal shares they hold in an attempt to interpret and preserve life. These shares, however, are inclusive, available for private ownership but only in common with everyone else—a complex thought about the privilege of sustaining wildlife that has not escaped our volunteer leaders. Eventually, an investment in the bedrock values of nature's environmental services obligates its shareholders to help safeguard and instill respect for those services.

As we are beginning to understand, the preservation of nature and the development of knowledge about it are keys to buying time for human society, time in which to respond to a new scale of human pressures on the natural world. We are in the business of ensuring that the living assets that create and sustain our environments and economies can persist. In contrast to the insurance company cited above, WCS pinpoints catastrophes in nature's survival with the purpose of combating their effects.

During the past year, our 101st, WCS leaders, members, and friends participated in several accomplishments on behalf of nature and this great city:

- ◆ In a powerful demonstration of community interest, the Mayor, the City Council, and the Bronx Borough President combined appropriations to pledge more than \$10 million for the Congo Gorilla Forest at the Bronx Zoo. Supporting the generosity of

WCS trustees, along with that of many foundations, corporations, and individuals, the City's vote of confidence enabled construction to begin on the 6.5-acre complex in fall 1995.

- ◆ With a stunning new design, the contemporary equivalent of its soaring predecessor, reconstruction began at the Bronx Zoo on the great 1899 aviary, which had been blown down in a February storm. Again, our supporters for the rebirth were legion—dozens of New Yorkers and two foundations.

- ◆ Imaginative new designs for the Central Park Children's Zoo have now won approval at every community and government level. Construction was scheduled to begin in fall 1996.

- ◆ Nearly four million visitors came to the five WCS facilities in New York: the Bronx Zoo, the Aquarium in Brooklyn, and the Wildlife Centers in Central Park, Queens, and Prospect Park. About a million of those visitors were students in groups from every school district in the City.

- ◆ A unique attraction for many of these visitors was Butterfly Zone, which graced the Bronx Zoo's Astor Court from late May on, and will return in summer 1997. The giant caterpillar structure, with its delightful gardens, was erected in just three months.

- ◆ National and grassroots efforts in Bolivia, with long-term assistance from WCS, created the Kaa-lyá del Gran Chaco and Alto Madidi National Parks, with more than 20,000 square miles in one of the world's most species-rich areas. Bolivian President Gonzalo Sánchez de Lozada declared the parks on September 22, 1995, and their management, aided by WCS, will involve the Izocéño Indians for Gran Chaco and the Tacana and Chimane peoples for Madidi.

◆ In southern China, the remarkable WCS education program won the support of government education authorities in Beijing. This groundbreaking effort—stressing ecology, human relations with other creatures, and conservation biology—should be seen in the light of China’s immense global influence on attempts to sustain the livability of Earth’s environments over the coming years.

WCS is helping to save wildlife and environments where the wildlife is, where the problems are greatest, and where the expertise of a science-based, nongovernmental organization can be most effective. That usually means developing countries where wildlife populations and biodiversity have not been completely eradicated or confined to reserves. Human population growth is one problem. From 1930 to 1990 these nations more than tripled their numbers, from 1.3 billion to 4.1 billion, from 64 percent to 77 percent of the world’s people. Yet, the needs of many nations afford opportunities to adopt policies providing local peoples a better chance to preserve their options as well as their wildlife, and to understand both.

We do not know where human population will level off or how much recognizable nature will be left when it does. There are no believable models, just one self-evident equation: stable population occurs only where deaths are not exceeded by births. We do know that regional demographics will vary enormously and that the greatest population growth is overlapping the homes of the last major wildlife populations. We also know that most populations have a rapidly expanding proportion of older people, an unprecedented circumstance that must alter services and perceptions, especially locally. And we know that time is short for affecting the values and decisions of those who control the future of the most spectacular wild places with large populations of wild animals.

These are not remote concerns. What will the population be when our current Children’s Zoo visitors are septuagenarians? The U.S. population grows by one percent each year. Should this rate continue for 70 years, today’s population of 260 million will double. Issues of conservation are as urgent in our own country as in the developing world. For that reason, we have renewed our North American program, targeting areas in Alaska, the Far West and Rockies, the Adirondacks and northeastern forests. It has become evident that there is a need for WCS to apply its brand of science-based, negotiation-managed conservation at home.

It is clear that the next 100 years will not be like the last 100 years, at all. Thus WCS’s main challenge will be to provide the information and understanding necessary to positively affect human choices, both at home and abroad.

Five tasks promise to dominate WCS’s future services:

First, our unique living exhibition-education programs here in New York must be both serious and entertaining. They must attract people in the first place and then involve them in understanding environmental options and interrelationships as though their lives depend on wildlife and nature, as they indeed do.

Second, we must greatly expand our effort to sustain wildlife and functioning ecosystems in a “nature” that is rapidly diminish-



*William Conway*

**PRESIDENT AND GENERAL DIRECTOR**

ing and becoming more zoo-like. What can be retained in reduced and fragmented spaces? And how can it be retained?

Third, all WCS services, at our zoos and aquarium, in the field, and around the world, must become even more self-supporting. Funding from the City and State have declined below their 1986 levels with no increase in sight.

Fourth, we must continue our leadership of the last decade in changing zoos and aquariums from static “living museums” to active centers for conservation and conservation science, which includes working directly in nature.

And fifth, we must form partnerships, with people and organizations, that strengthen the commitment of our New York communities to the survival of nature.

WCS is at the center of our life in the City and our survival on the planet. How we deal with the environment now, what we are able to protect and preserve of Earth’s biodiversity and natural resources and what we are able to provide for succeeding generations, will determine the wealth or poverty of our future. In that sense, we hope that our balance sheet, like our purpose, might some day soon approach the status of our multinational colleagues.

*"The Zoo has become a new kind of institution in which individuals and groups of animals are ambassadors for the survival of their species in nature."*



Above: Preparing for a late spring opening, Associate Curator of Mammals Edward Spevak and Horticulture Curator Robert Halpern (foreground) confer on the planning of the Butterfly Zone as it rises on the great mall of Astor Court.  
Right: Erika Talesnik with monarch butterflies.

# people and wild

## BRONX ZOO

With a wildlife population of 3,955 mammals, birds, reptiles, and amphibians, plus countless invertebrates, the Bronx Zoo is the heart of the Wildlife Conservation Society's worldwide activities. The Zoo opened in 1899, fulfilling the Society's charter, and serves as the flagship for four other WCS facilities in Brooklyn, Manhattan, and Queens, as well as the St. Catherines Wildlife Survival Center in Georgia.

The changing role of zoos from taxonomic inventories to conservation parks has been pioneered in large part at the Bronx Zoo. Through breeding programs, environmental exhibitions, educational curriculums, an emphasis on science, and innovative designs and graphics the Zoo has become a new kind of institution in which individuals and groups of animals are ambassadors for the survival of their species in nature. In this cross-disciplinary endeavor, the Bronx Zoo is today headquarters for local, national, and international programs in field conservation, ecological education, wildlife health sciences, and exhibition design.

Last year, 2,056,114 people came to the Zoo, where they visited Wild Asia, JungleWorld, Baboon Reserve, the World of Birds, the World of Reptiles, Himalayan Highlands, and many other dramatic habitat environments. We created a new theater of wonder and education in the great Butterfly Zone, which opened on Memorial Day Weekend, May 25-27, for a four-month run. In the elegant botanical and musical setting of a huge tent, stretching 170 feet along the Astor Court mall in the shape of a giant caterpillar, 121,380 visitors enjoyed the more than 1,000 butterflies and moths of over three dozen species during the first month of operation. Through the butterflies themselves, as well as special areas for breeding and incubation, inventive graphics, and a maze highlighting the dangers of butterfly life, visitors also learned about the fascinating life cycle of these invertebrates, why their numbers are declining, and how WCS and other conservation organizations are trying to save them in all their diversity.

## Mammalogy

Many wildlife species have become threatened in our national parks by the very success of those parks for people. In July 1995, the department helped the U.S. Fish and Wildlife Service rescue four grizzly bears, two females and two males, in Montana and Wyoming. Classified as "nuisances" too accustomed to humans and human habitations, they had previously been unsuccessfully relocated and were scheduled to be destroyed. Three of the bears already had buckshot in them that would be difficult to remove. Consequently, all four animals were moved to the Bronx Zoo, where they immediately became public favorites in the refurbished big bear habitat.

Other important additions came through breeding. A female Indian rhinoceros, named Dailey after trustee and chairman of the Wildlife Crisis Cam-

*life in new york*



paign Dailey Pattee, was born on December 28, 1995. The calf is our first second-generation rhino and an important birth in saving this highly endangered species. Her parents are Ella, the first rhino born at the Bronx Zoo, named for our late trustee, Mrs. William Ward Foshay, and Vinu, a male brought from the Metro Toronto Zoo as part of the Indian Rhino Species Survival Plan.

Representing another species that WCS has helped protect, both in Ethiopia and at the Zoo, was our newest gelada baboon, born in November. This young male can be seen exploring or riding around on his mother or aunt in the spectacular Baboon Reserve. The Reserve's other new residents this spring were four young hyraxes born earlier.

An unexpected birth occurred in the montane rain forest of JungleWorld. Gibbons are typically born about 730 days apart, but in October a male white-cheeked gibbon was born just 276 days after a previous birth. There were concerns that the mother might not care for both offspring before the elder one was weaned, but she proved to be more than up to the task, and the entire family can be seen swinging through the tall trees of JungleWorld.

*An unusual family of four white-cheeked gibbons at home in JungleWorld.*



In October, ground was broken and construction begun in the southwest corner of the Zoo on Congo Gorilla Forest. This 6.5-acre habitat and education complex will be home for lowland gorillas, okapis, mandrills, guenons, red river hogs, and other equatorial African species. The Forest will enhance the breeding program for these endangered species and involve visitors more directly in their fate through interactive exhibits and choices to support WCS projects in the Equatorial African forest.

Meanwhile, at the old Great Apes House, the five baby gorillas born in 1994, including twins Ngoma and Tambo born to Pattycake and Timmy, have been added to Timmy's troop. The old silverback continues to be the protective patriarch, watching the babies closely among his charges.

The department continues to work actively in the Taxon Advisory Groups (TAGs) and Species Survival Plans (SSPs) of the American Association of Zoos and Aquariums (AZA). Zoo mammal personnel—including General Curator Jim Doherty, Assistant Curators Ed Spevak and Pat Thomas, and Collections Manager Penny Kalk—participate in more than half of the mammal TAG and SSP committees. The aim of these zoo conservation programs is to maintain genetically and demographically healthy populations of animals that also serve as indicators of the status of wild environments, for our visitors, of what is happening to wildlife and wild places around the world. The department was also assisted by dedicated interns funded through the generosity of the Robert G. and Jane V. Engel Foundation.

### **Ornithology**

After the 1899 aviary collapsed during a snow storm in February 1995, planning began immediately for the resurrection of the great structure in a new form, and funding was received from donors large and small. The new and larger aviary, now called the Russell B. Aitken Sea Bird Colony in tribute to major donors Mr. and Mrs. Russell B. Aitken, is scheduled to open in spring 1997. It will continue the theme of a South American coastal habitat and will house many of the same species as before, including Inca terns, gray gulls, cormorants, and penguins. There will be new entrances, an enlarged pool, and an extended public path exiting at the north end.

Renovation continued on the first floor of the World of Birds, with major backing from the Wallace Fund. A new ceiling, climate-control equipment, graphics, and labels were installed. New exhibits include those for birds of paradise, completed in summer 1995, and for bee-eaters, scheduled for fall 1996. The remaining lower-floor exhibits will be renovated in fiscal year 1997.

Nineteen birds from Papua New Guinea—lories and other parrots—entered the collection as a gift from Ann and Barry Love, who have been associated with conservation in that country for 17 years. The Loves are long-time friends of the Research and Conservation Foundation of Papua New Guinea, which WCS helped found. Included in the group at the World of Birds is a species never before seen in North America—the purple-bellied lory.

Lesser adjutant storks, a highly endangered Asian species, have been added to the recently erected stork exhibit. Student interns, funded by Mrs. Charles Fritz, have put in hundreds of hours of observation in an effort that should tell us more about the storks' breeding needs and behavior.

Several initiatives are underway to learn more about the status in nature of some of the world's rarest pheasants. For the last two years, Upoki Ag-enoga, a Zairean student, has been working with Senior Conservation Zoologist John Hart to determine the numbers and locations of the Congo peafowl. In Kalimantan, Indonesian Borneo, a student has started what may be several years of pheasant surveys, with initial emphasis on the Bornean peacock pheasant. The Department is also working closely with Taman Safari to develop pheasant and bird of paradise breeding programs in Indonesia.

In Malaysia, successful pheasant breeding programs, worked out in collaboration with the government, are already in place. The mountain peacock pheasant captive population has grown from only 12 founders to over 300 birds in just seven years. Malayan peacock pheasants continue to increase in numbers.

In June 1996, the Bronx Zoo hosted a meeting of the Congo Peafowl Trust, which is headquartered at the Antwerp Zoo in Belgium. Chairman Donald Bruning is the Species Survival Group (SSP) coordinator for the species in North America, and he and Curator Christine Sheppard are now in charge of the American Association of Zoos and Aquariums (AZA) Taxon Advisory Group (TAG) for pheasants. The department now coordinates five SSPs and TAGS as well as seven studbooks for the AZA.

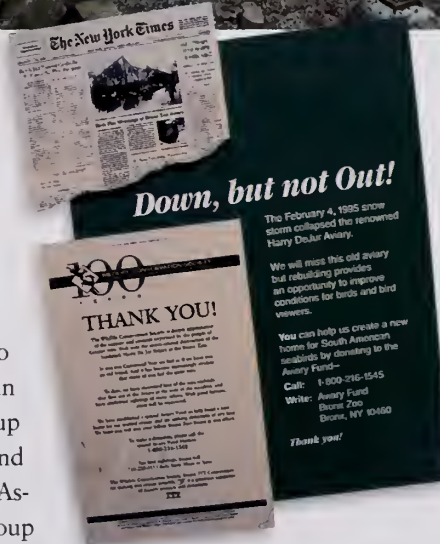
#### Reptiles and Amphibians

On May 25, 1996, the Reptile Conservation Station opened at the World of Reptiles, funded by WCS patron Andrew Sabin. Through graphics,

*George V. Grune, WCS  
Trustee and Chairman of  
the DeWitt Wallace and Lila  
Wallace Reader's Digest Funds*



*A new and larger structure of parabolic arches, the Russell B. Aitken Sea Bird Colony, rises in place of the 1899 Aviary, which was destroyed by a winter storm in 1995.*



live exhibits, and the assistance of specialists staffing the station, visitors are invited to learn more about WCS efforts in reptile and amphibian field projects, endangered species breeding, and conservation methods. Five major projects—Species

Survival Plans, the Turtle Recovery Program, Madagascar Conservation, Giant Snake Survival, and the Turtle Recovery Program—are graphically described. They are also represented by hatchlings of Chinese alligators, Madagascar radiated tortoises, South American anacondas, and local bog turtles. A videotape highlights WCS work with translocating threatened gopher tortoises from mainland Georgia to St. Catherines Island and reintroducing hognose snakes at Breezy Point in Coney Island and Sandy Hook in New Jersey. Special monitoring and measuring equipment used in the field are shown and illustrated by a videotape of tortoises being radio-tracked. The Station offers visitors a chance not only to learn about but to actually participate in and support these important initiatives.

Joining the World of Reptiles collection was an ivory-colored snapping turtle caught by an eel fisherman in New Jersey's Paulskill River. The result of a rare genetic mutation, this unusual



animal now stalks crayfish and minnows in a new 1,200-gallon habitat. New environments were also created for the Australian inland bearded dragon, the banded Egyptian cobra, and the bushmaster, a snake ranging from Costa Rica southward that is the largest venomous reptile in the New World. The year's hatchlings included Florida indigo snakes, South African speckled padlopers, red-headed Amazon sideneck turtles, Hamilton's pond turtles, Egyptian tortoises, Solomon Island prehensile-tailed skinks, Travancore tortoises, and an African hingeback tortoise.

The involvement of Curator John Behler with major conservation projects continued. In October, he traveled to Madagascar, where he visited important reserves and conservation areas from the spiny desert to the montane rain forest. The translocated gopher tortoise colony on St. Catherines Island flourished under the watchful supervision of Behler, Senior Veterinarian Bonnie Raphael, and Wildlife Survival Center Zoologist Jeff Spratt. In

Venezuela, the giant snake conservation project was pursued by Collection Manager William Holmstrom and Keepers Christina Castellano and Frank Indiviglio, and on Long Island, Keeper Jim McDougal and staff veterinarians began an eastern box turtle health assessment study.

The Department lost an outstanding collaborator with the death in March of Dr. Warren Wetzel, who founded and led the New York City Snakebite Trauma Center at Jacobi Medical Center in the Bronx. From 1980 to 1996, he treated and saved more than 100 victims of snakebite. During that time, he conducted legions of young physicians through the World of Reptiles on behind-the-scenes tours and developed many effective antivenins with the Department's consultation. A symposium titled "The Management of Envenomation Emergencies," inspired by Dr. Wetzel's work, was held at Jacobi in June.

Right: A rare ivory snapping turtle from New Jersey joined the collection.

Below: Collection Manager Bill Holmstrom and membership guide Michael Liebler greeted visitors to the new Reptile Conservation Center.



### ST. CATHERINES WILDLIFE SURVIVAL CENTER

Most programs on the island were favorably reviewed by the new Research Committee of WCS curatorial, wildlife health, and international staff. Found particularly valuable to the conservation of habitats and critically endangered species were the free-ranging lemur projects, which are clearly linked to the prospect of reintroduction attempts in Madagascar. These and all the island's breeding and research projects are supported by the St. Catherines and Edward John Noble foundations. WCS Curator of Herpetology John Behler is now coordinator for the island's activities. John Iaderosa serves as curator, and Royce Hayes as superintendent.

In developing techniques for the successful reintroduction of

ruffed lemurs, for instance, WCS staff has worked closely with the Ruffed Lemur Species Survival Plan (SSP) and the Madagascar Faunal Interest Group of the American Zoo and Aquarium Association (AZA). It appears now that a ruffed lemur restocking project has been identified for the Betampona Natural Reserve in Madagascar. AZA's Prosimian Taxon Advisory Group (TAG) has initiated a similar project for the reintroduction of ring-tailed lemurs as the beginning of a larger effort to preserve the unique environments of southern Madagascar. Reintroduction prospects are also good for the Center's cranes, hornbills, psittacines, Malagasy tortoises, and gopher tortoises, while the Grevy's zebras and lion-tailed macaques, though still important to SSP breeding, are not now planned for reintroduction.

Most of these endangered species



bred during the year, including four Florida sandhill cranes, three paradise cranes, three wattled cranes, and three lion-tailed macaques. Two palm cockatoos hatched in June, our first chicks of this species in eight years; ten ring-tailed lemurs were born among our three free-ranging groups; and ten Nile lechwe were born in that herd. Our fledgling lesser kudu herd, with one of only three breeding males in North America, had three offspring; and all but one of the bontebok females were bred by a formerly belligerent male quieted by haloperidol, a drug originally developed for human use.

The Center's staff of seven produced ten publications this year, including papers on relocated gopher tortoises, free-ranging primates, the future of lion-tailed macaques in captivity, hornbills, blue-throated macaws, Jackson's hartebeest, and bontebok husbandry.



*Free-ranging ring-tailed lemurs are one of many endangered species at the Wildlife Survival Center, which is funded through the generosity of Frank and June Larkin.*

## AQUARIUM FOR WILDLIFE CONSERVATION

Attendance reached several peaks during the centennial year of the nation's oldest aquarium, which was founded in 1896, just one year after the Society itself. The new Aquatheater and the exhibition "Fish That Go Zap!," opened at the end of fiscal year 1995, drew visitors in dramatic numbers throughout July and August. Despite the harsh winter, attendance was within 5,000 of the record established after Sea Cliffs opened in 1994. Total Aquarium attendance for the year was 782,540.

In September, the Aquarium's first "Dinner by the Sea" honored well-known advocate of environmental protection Evan Davis. Co-ordinated by Aquarium Marketing and Support Committee chair Craig Taylor and dinner-committee chair Tazwell Smith, the dinner raised funds for the Aquarium's education programs. Another major event was the second annual celebration of dolphins throughout the month of June. "Dolphin Doo-Wop" paid tribute to the 1950s, the decade of the Aquarium's new opening in Brooklyn. Musical entertainment each weekend, decorative staging, and trainers dressed in classic '50s shirts all contributed to a fun-filled month, and the highest June attendance ever at the Aquarium.

Marine mammals were, in fact, at the center of a number of changes and additions. Work began on a new enclosure over the Oceanic Tank to provide a winter home for the three male Atlantic bottlenose dolphins on breeding loan from Sea World in exchange for our three females. The exchange is already working; Starky gave birth during the year at Sea World in Florida. Our six beluga whales are still on view in their breeding complex, and plans are

now complete for the installation of larger viewing windows for the public in one of the pools. The three orphaned baby walrus calves that arrived at Sea Cliffs from Alaska in spring 1995 have now grown to 700 pounds each.

Visitors were delighted as well by a squadron of cownose rays, which performed their gracefully synchronized underwater flight in the Oceanic Tank. These rays can have "wingspans" up to three feet.

The Aquarium has been successful in breeding many threatened species of Malagasy cichlids and is distributing the offspring to other aquariums across the United States and in Europe. It is hoped that eventually the species being bred can be returned to Madagascar when their aquatic habitats are restored. This project is being directed by Associate Curator for Freshwater Fishes Paul Loiselle, whose travels in Madagascar have even turned up cichlid species previously thought extinct.

The mission of the Society's aquatic research arm, the Osborn Laboratories of Marine Sciences (OLMS), has been recast to focus on critically affected ocean species and habitats. The new Critical Ocean Wildlife Recovery Initiative (COWRI) works closely with two other WCS divisions—International Conservation and the Science Resource Center—on efforts in three program areas based at the Aquarium and in nature.

In basic and applied research, COWRI's first program area, the post of director of fishery research programs was created during the year, with funding from the David and Lucile Packard Foundation, to deal with problems involving the serious decline of many of the world's fisheries, and a number of appropriate projects will soon be launched. Coral ecosystems around the world are another



*Above: Children enjoy fishes in the schooling tank at the Aquarium's Discovery Cove.*

*Right: ITT's gift to the Wildlife Crisis Campaign helped fund Sea Cliffs at the Aquarium and African Village at the Bronx Zoo, thanks to Mr. and Mrs. Rand V. Araskog, WCS trustee and advisor, respectively.*



subject of concern. The Coral Culture and Research Lab has been created within OLMS to explore facets of coral biology where controlled laboratory conditions are required, all in support of conservation studies being conducted by WCS field staff, particularly in Belize and Kenya. The third research focus is on fragile coastal habitats, such as mangrove forests and saltmarshes, and their critical importance as nurseries, refuges, and generators of food for an incredible array of ocean species.

In COWRI's second program area, public awareness and education, the major goals are to build a strong base of public awareness about the importance of ocean conservation and to increase learning about aquatic wildlife and habitats. At a national meeting of aquarium directors held in June under the auspices of the Ameri-

can Zoo and Aquarium Association (AZA), OLMS Director Paul Boyle and Aquarium Director Lou Garibaldi succeeded in launching a groundbreaking collaboration among institutions to create and plan the National Ocean Awareness Campaign.

Thirdly, COWRI hopes to shape marine conservation policy, based on strong scientific data. Toward that goal, the Aquarium and WCS's International Program have taken a lead role in forming the Ocean Wildlife Campaign, a collaboration with six other conservation organizations: the National Audubon Society, the National Coalition for Marine Conservation, the Natural Resources Defense Council, the New England Aquarium, the Worldwide Fund for Nature, and the Center for Marine Conservation. Now in its third year, the Campaign is designed to conserve and restore large ocean fishes such as bluefin tuna, sharks, swordfish, and marlin. As part of the collaborative, the Aquarium hosted a World Oceans Day in June in which visitors were provided information about critical fishery issues, and interpretive entertainers transformed aquatic images into ocean conservation messages.

#### **CENTRAL PARK WILDLIFE CENTER**

Exactly 755, 972 people visited the Center during the year, many of whom experienced subtle changes and improvements in the facility and its wildlife populations. Black-necked swans were introduced to the snow monkeys' watery, temperate habitat; and common tree shrews, mouse-birds, and Rodrigues fruit bats were added in the Tropical Zone. Both gentoo and chinstrap penguins were hatched in the Edge of the Ice Pack,

for a total of ten gentoos and two chinstraps since 1988, an important contribution to the science of penguin management.

Standing's day geckos were also hatched, as were several extinct-in-nature Wyoming toads. The Center participated in a collaboration with the U.S. Fish and Wildlife Service and six other zoos, including WCS's Prospect Park Wildlife Center, to breed the latter species and reintroduce it in its natural habitat. Collection Manager Bruce Foster supervised return of the tadpoles to the U.S.F.W.S. for release in the wild during summer 1996.

Animal Curator Peter Brazaitis continued his long association with the Division of Law Enforcement of the U.S. Fish and Wildlife Service as its principal forensic specialist. He conducted research in the identification of reptile hides and products with support from the USF&WS and WCS patrons Susan and David Tripp, and shared his knowledge with agency biologists in a training course held at the Center's Zoo School. Director Dan Wharton's work in the science of small population management and zoo breeding methodologies included leadership in several programs of the American Association of Zoos and Aquariums: as chair of the gorilla and snow leopard Species Survival Plans; chair of the Population Management Plan subcommittee of the Wildlife Conservation Management Committee; and working member of the Small Population Management Group.

The Center's Wildlife Gallery held a full and distinguished series of exhibitions, curated by Administrator Denise McClean. Already underway at the beginning of the fiscal year and running to September 4 was "Saving Wildlife: The First 100 Years," a celebration of the Society's Centennial. The works of Carl Rungius, Helen Tee-Van, Bruce Horsfall, and other artists associated with the Society since 1895 were featured in "The Society and Great Wildlife Artists," which ran from October 7 to February 29, 1996. Then came "Birds of China," the exquisite contemporary watercolors of J. Fenwick Lansdowne, from March 16 to June 2, and the year closed, beginning on June 8, with watercolors of African wildlife done in the field by Deborah Ross, who has been one of the Society's leading artistic interpreters of animal life over the past dozen years.

#### QUEENS WILDLIFE CENTER

Finally freed from the construction barriers around its perimeter, the Queens Wildlife Center continued to experience an attendance rise, to 185,132 visitors. Unobstructed, the Center became a full-fledged member of the Flushing Meadows Corona Park community, celebrated as such on the now traditional Groundhog Day sighting attended by Queens Borough President Claire Schulman and Commissioner of Parks and Recreation Henry Stern.

Special attention was paid to the South American spectacled bears that had arrived in the previous

year. Starting in October, in a project funded by the Freed Foundation, volunteers from local colleges, high schools, and staff recorded on palm-sized computers the habits and behaviors of the two bears as they used their environment. The goal is to provide as much variety for the animals as possible in opportunities for digging, feeding, climbing, playing, and even sleeping and hiding.

There was also an increased response to the internship program, active primarily in the summer with some 12 to 15 young people from local colleges and high schools. Two veterinary technician students from LaGuardia College fulfilled academic requirements at the Center. Students from John Bowne Agriculture High School were supported by New York State's Training Opportunities Program (TOP) for rotating positions in education, horticulture, and animal management. Experience with animals at the Center has helped some previous interns to qualify for admission to veterinary programs.

A new attraction was being prepared for the marsh area near the Center's entrance, where three American alligators were to be introduced during the summer. Depending on our success with them, the alligators may be invited back next summer.

#### PROSPECT PARK WILDLIFE CENTER

In its second full year of operation, 213,290 people visited the Brooklyn facility. Plans were underway to make the outdoor aviary a home for African birds—demoiselles cranes, red-crested touracos, glossy starlings, and other species, but most of the year's events, like the Center itself, were educational in nature.

The Center was, however, engaged in a number of important projects within and outside the Wildlife Conservation Society. Don-

*Prairie dogs dig their burrows along the Discovery Trail at the Prospect Park Wildlife Center.*



na Fernandes, from the Franklin Park and Stone zoos in Boston, began her tenure as associate curator of animals and served also as interim curator of education. She is science correspondent for the National Public Radio program "Living on Earth," on which she appeared several times during the year, and is surveying dragonflies, damselflies, and butterflies for the WCS conservation project being directed by Science Resource Center Director Fred Koontz in the Great Swamp of Putnam and Dutchess counties.

Lewis Greene, the Center's director, continues to help with a breeding program for Baird's tapirs in Panama and hopes to do the same in the U.S. through the Tapir Taxon Advisory Group (TAG), on which he serves, under the American Zoo and Aquarium Association (AZA). Keeper Marion Glick-Bauer is currently conducting a survey around the country on husbandry in meerkats, one of the Center's most popular animals.

#### EXHIBITION AND GRAPHIC ARTS

After many years of planning, construction of the Congo Gorilla Forest began in October 1995. At the public groundbreaking that month the project was officially launched with more than

two-thirds of the funding in place from the Mayor's Office, the New York City Council, the Bronx Borough President, and many private donors. Thousands of rarely seen, winter-hardy plants are being raised to create an analogous Afrotropical landscape. Two 40-foot-tall honey locust trees (weighing ten tons apiece) have already been transplanted out of the way of construction and into the new gorilla habitat, along with a magnificent 30-foot-tall wisteria vine.

The Society's largest and most ambitious exhibition complex to date, the 6.5-acre Congo Gorilla Forest will provide a breeding sanctuary for rare and endangered African forest species. The animals' living habitats will surround on-site classrooms and a teacher training center at the heart of the complex. General visitors will experience the animals and the forest through closeup views, interpretive graphics, interactive exhibits, and the opportunity, ultimately, to support WCS conservation efforts in equatorial Africa. Audience research, through focus groups and surveys, and part of the design is being funded by the National Science Foundation.

During spring 1996, on Astor Court's great lawn, the exhibition and horticulture staffs created the Butterfly Zone, a woodland glade and wildflower meadow butterfly habitat within a gigantic 170-foot-long replica of a tobacco hornworm caterpillar. Some 3,000 plants of 75 species were used inside and out. From the interior garden, with its 1,000 butterflies of 40 species, visitors exit through a colorful gift shop into "Be a Monarch for a Minute," an educational maze describing threats during the butterfly life cycle from egg through caterpillar and adulthood.

Another monumental vaulted structure, the soaring six-story aviary for the Russell B. Aitken Sea Bird Colony, was well underway on the site of the original 1899 aviary, destroyed during a winter storm in early 1995. The innovative new design provides nearly 50 percent more space for bird flight and for visitors to explore the coastal habitat.

During the historic summer drought, tempestuous fall, and record-breaking winter blizzards, the Zoo lost about 50 trees, many of them dating from around 1900. However, new plantings more than kept pace, with over 1,300 shrubs and 230 new trees, mostly native to New York and including varieties of American elm resistant to Dutch elm disease. Over the past three years, with the focus on renewing the native forest, improving exhibits, and replenishing screen planting around the perimeter of the Zoo, the number of kinds of plants in the Zoo has increased threefold.

In Kenya, construction is expected to start on the Nairobi Safari Walk in Nairobi National Park by 1997. The Kenya Wildlife Service has now selected renowned Nairobi architectural and landscape firms from over 50 Kenyan applicants to carry out the WCS designs. This super nature center, to be built on the site of the well-known animal orphanage, will take visitors to the treetop level of leopards, into waterhole blinds to view savanna wildlife, and into a children's corner to meet smaller animals up close.

*Two 40-foot-tall honey locust trees were transplanted to the Congo Gorilla Forest, which is now under construction at the Bronx Zoo.*





## WILDLIFE HEALTH SCIENCES

From the Wildlife Health Center at the Bronx Zoo, the veterinary staff ministered to more than 10,000 animals of 1,000 species at WCS's five New York facilities and the St. Catherines Wildlife Survival Center in Georgia. Through its Clinical Medicine, Pathology, Nutrition, and International Field Veterinary programs, the department also helped conduct and promote medical and conservation research across the country and around the world.

After years of dedication, Mrs. Joseph A. Thomas stepped down as trustee chairman of the Wildlife Health and Sciences Committee and was succeeded in the post by Mrs. Thomas Unterberg. Mrs. Thomas was crucial to the creation of the Wildlife Health Center and to its early evolution as a clinical, research, and teaching hospital. This year she made possible a major gift for the nutrition, Aquarium, and other programs. Mrs. Unterberg will help guide a much expanded program directed by Chief Veterinarian Dr. Robert A. Cook.

### Clinical Medicine

The Bronx Zoo's five young lowland gorillas were the focus of intense scrutiny as they were introduced to the public at the Great Apes House, first in the company of human caretakers, in summer 1995, and this year as part of a gorilla troop led by their father, the silverback Timmy. All have fared well under Dr. Cook, Senior Veterinarian Bonnie Raphael, and staff.

Clinical studies during the year included an ultrasound evaluation of an Indian rhino's reproductive tract by Dr. Raphael with Assistant Veterinarian Dr. Mark Stetter and consulting ultrasonographer Dr. Thomas Hildebrand, and tests of medetomidine, a safer and more effective anesthetic for deer species, conducted by Dr.



*Above: Five gorilla youngsters get checkups from Senior Vet Dr. Bonnie Raphael, aided by Assistant Supervisor Joseph Mahoney.*  
*Left: Ann Unterberg, new head of the Wildlife Health and Sciences Committee, and her husband Thomas are major donors to the Wildlife Crisis Campaign.*

Linn Klein, a consulting large animal anesthesiologist from the University of Pennsylvania. Depo leupron, donated by TAP pharmaceuticals, was tested on a variety of mammals as a method of alleviating overzealous male breeding behavior. Working with the Department of Herpetology, multi-year projects were initiated to determine the health status of threatened turtles and tortoises in the wild. A study to develop new and safer methods of anesthetizing amphibians was begun by Dr. Stetter.

Senior Veterinarian Dr. Paul Calle led the Aquarium team, including Laboratory Manager Kate McClave, through months of treatment to cure Jeri, a bottlenose dolphin, of a life-threatening fungal pneumonia. Also cured were the walrus Ayvec, whose infected tusks were removed by Drs. Calle and Cook, with the help of Dr. Klein and consultant Dr. Jim Grillo, and a sea otter critically ill with a hemorrhage in the chest cavity. Despite heroic efforts that included an intravenous line and multiple plasma transfusions, a

two-year-old beluga whale succumbed to severe intestinal problems. Responding to FDA regulations, the department also became more involved in the care of the Aquarium's fish population.

At the City Wildlife Centers, under the guidance of staff veterinarians Calle and Stetter, care was administered by veterinary technicians Berni Leahy at Central Park, Kimm Koocher at Queens, and Veronica Greco at Prospect Park, with the Wildlife Health Center in the Bronx providing oversight and use of modern techniques and equipment when needed. Olympus America, Inc. and Ethicon Endosurgery, Inc. continued to work with Dr. Cook on minimally invasive surgery for amphibians, reptiles, birds, and mammals, SDI Inc. provided Pulse Oximetry monitoring capability, and Henry Schein Inc. gave the clinical program a dental station to upgrade restorative and endodontic procedures.

### **Pathology**

As one of only five full-time zoo pathologists in the country, Dr. Tracey McNamara leads an effort to increase training in this area, which is so crucial to the diagnosis and prevention of disease in precarious zoo populations of endangered animals. She currently heads the Zoo Pathology Consortium formed three years ago by the five zoos—the Bronx, National, Brookfield, Philadelphia, and San Diego—and has taken on the task of gathering glass slides and other materials from existing sources for use in training modules for this critically important and often neglected field.

One source is the Armed Forces Institute of Pathology, which has been archiving glass slides of exotic animals for 40 years that are already the basis for regular meetings at the Society's Wildlife Health Center. Another source is the Charles Louis Davis, D.V.M. Foundation for the Advancement of Veterinary and Comparative Pathology. Dr. McNamara has also called on individual researchers to supply glass slides. The goal is to compile a large collection of slides for teaching purposes that would also be available on interlibrary loan through a new Registry of Comparative Pathology. Similar efforts are being made with kodachrome slide carousels, literature databases, computerized pathology

records, and CD-ROM teaching materials. Dr. Michael Linn, second-year pathology resident, is helping create these programs.

Dr. McNamara's lecture for the Armed Forces Institute of Pathology on reptile and amphibian pathology was videotaped under the auspices of the Davis Foundation and will be distributed to every veterinary college in the world within the next three years.

### **Nutrition**

Under Department Head Dr. Ellen Dierenfeld and Laboratory Supervisor Marianne Fitzpatrick, the Nutrition Department processed 1712 plasma and tissue samples during the year for vitamin and mineral content. Some 580 of those applied to samples collected at WCS facilities: the Bronx Zoo, Aquarium, Central Park and Queens Wildlife Centers, and the St. Catherines Wildlife Survival Center. The laboratory also worked closely with WCS field projects, analyzing fruit minerals for Tim O'Brien and Margaret Kinnaird in Sulawesi, golden monkey foods for Bill Bleisch in China (with R.C. Kirkpatrick at the University of California at Davis), foods for howler monkeys in Belize with Scott Silver at Fordham University, and several projects with Field Veterinarian William Karesh. Assays were also conducted for 26 other zoos and wildlife organizations, from the Peregrine Fund to the Dallas Zoo. Seventeen volunteers from our own Friends of Wildlife Conservation and several universities assisted on many of these projects. Major funding for the program was provided by The Perkin Fund.

Two new long-term projects were initiated, one with funding from the International Rhino Foundation to establish baseline information about the nutritional status of the five remaining rhino species, all of which are severely endangered, in part by determining the suitability of the horse as a comparative model. The second project, in collaboration with WCS primatologists Colleen McCann and Robert Lessnau, is investigating the nutrient composition of foods selected by free-ranging primates on St. Catherines Island. A new computer software program developed through an Institute of Museum Services grant will be released later this year for the global evaluation and management of zoo animal nutrition.

### **Field Veterinary Program**

Dr. William Karesh directed 36 projects during the year concerning wildlife health, genetics, and ecological use in Africa, Asia, Europe, South America, and the United States. Major funding came from the Schiff Family, Dr. Judith Sulzberger, Mrs. Thomas Unterberg, Caroline Sidnam, and Pamela and Renke Thye. An endowment was begun this year to provide long-term support.

Health monitoring for coastal wildlife populations in Patagonia, including penguins, other seabirds, and marine mammals, was expanded to cover 1,500 miles of coast, stretching from Peninsula



*Through Peter and David Schiff, The Schiff Family gifts to the Wildlife Crisis Campaign established the Distinguished Scientist in Pathology and helped fund the Field Veterinary Program.*

Valdez south through Tierra del Fuego. Dr. Karesh worked with Dr. Cook, Claudio Campagna, and others on South American sea lions, Magellanic penguins, guanacos, pampas deer, and other animals. In the Amazon Basin, Drs. Karesh and Stetter conducted simultaneous studies in Bolivia and Brazil resulting in the first health status assessments of wild peccaries.

Working with Russian scientists, Drs. Karesh and Calle evaluated the last remaining populations of spur-thighed tortoises along the Black Sea coast and consulted on marine mammals. In Zaire, new radio-tracking devices were inserted into the horns of five of the 30 remaining northern white rhinos there in order to improve anti-poaching activities.

Training courses were conducted for local wildlife veterinarians in Borneo by Drs. Karesh and Raphael, who also helped government officials with health evaluations of sun bears. Other projects in Asia included genetic and health surveys in Malaysia and Indonesia on orangutans, which are under increasing pressure from human activities.

## SCIENCE RESOURCE CENTER

Several WCS field projects were given crucial technical and scientific aid by Center staff. Melissa Connor, our new geographical information systems analyst, created and analyzed detailed maps by computer to help determine the extent of remaining tiger habitat in Asia and to understand coastal wildlife resources in Patagonia. Director Fred Koontz and Ornithology Research Associate Susan Elbin, funded by the National Park Service, studied bird responses to restored grasslands in Gateway National Recreation Area in New York City. In New York's Putnam and Dutchess counties, Dr. Koontz worked with Bill Weber and Michael Klemens to coordinate ecological monitoring in the Great Swamp. Dr. Koontz also helped Claudio Campagna in Argentina follow the movements of southern sea lions with satellite transmissions.

George Amato, head of the Center's Conservation Genetics Program, collaborated with WCS scientists on several projects. Working with Ullas Karanth in India, he used molecular markers to monitor Indian tiger populations. Amato began a similar project devoted to lynx and bobcat populations in North America, here assisted by Salisa Rabinowitz. For Jefferson Hall and his field studies in Zaire, a genetic survey of Grauer's gorillas was completed. The evolutionary relationships of four endangered Madagascar tortoises were determined for Herpetology Curator John Behler. And a genetic analysis of babirusa living in North American zoos was conducted with Mammals Collections Manager Penny Kalk.

The Center's Academic Outreach and Education Program involved several collaborations. Dr. John Gatesy of the University of Arizona completed a four-year project with George Amato and George Schaller on the evolutionary relationships of Asian antelopes. Dr. James Gibbs of Yale University focused on turtle genetics and presented a workshop on statistical methods for monitoring wildlife populations. Scott Silver and Linde Ostro, both involved in



*Conservation Biologist George Amato has found genetic markers to monitor several wildlife populations, including black rhinos in Africa.*

the WCS 1992-94 translocation of black howler monkeys in Belize, conducted a census of the animals that concluded they were doing well in their new Cockscomb Basin home. Participation in Columbia University's Center for Environmental Research and Conservation and the New York Consortium on Evolutionary Primatology involved workshops conducted by Drs. Koontz and Amato on conservation genetics, ecological analysis, and zoo biology. Susan Elbin coordinated the Bronx Zoo Keeper Training Program, completed by 32 staff members, and organized a continuing education program about the Internet for 25 keepers and animal supervisors.

Wildlife Information Services, led by Steve Johnson, acquired new software for searching and tracking scientific books and magazines and installed an Internet access computer for the library reading room. The Center's own Worldwide Web site, developed with funding from the Vincent Astor Foundation and Mrs. George K. Moss, was established at <http://www.wcs.org>. Johnson also worked with Dr. Koontz and a team led by Comptroller John Hoare, Assistant Comptroller Mike Mariconda, and Assistant Director Rowan Murphy to begin assembling a Society-wide computer network.

Wildlife Collection Services, under Registrar Nilda Ferrer, now manages more than 25,000 individual animal records while overseeing animal shipments and obtaining wildlife permits for the WCS zoos and aquarium.

*"Though we are from different places, we share a common wish. That is to protect animals."*

ZHANG LEI

WUHUA SCHOOL, KUNMING, CHINA



*Olive baboons (above) are among the animals that will be part of the close-up learning experience for visitors, such as this Kenya Wildlife Clubs nature trail group(right), to the planned Nairobi Safari Walk in Kenya, which was designed by WCS.*

# *educating the*

Through its programs at the Bronx Zoo, the Aquarium, and the wildlife centers in Central Park, Queens, and Prospect Park, WCS is the primary source for environmental education in New York City, reaching more than 2.3 million schoolchildren each year. Conservation curriculums developed by WCS with strong teacher training components are used in 48 states and several countries abroad, helping to spearhead the revival of natural science teaching.

## **BRONX ZOO EDUCATION**

### ***International Programs***

In March 1996, Annette Berkovits, WCS vice president for education, traveled to Beijing at the invitation of Wang Wenzhan, who as director of the basic education department of China's state education commission is responsible for the education of more than 220 million children. Berkovits and Wang discussed expanding cooperation between WCS and China beyond Yunnan into three other provinces, including Sichuan, home of most of China's surviving giant pandas, where WCS teacher-training and curriculums will be introduced in summer 1997. WCS is the first foreign conservation organization to work inside the Chinese school system.

The existing program in Yunnan reached 2,493 new students, bringing the three-year total to more than 7,800 Chinese students using WCS curriculums. Students at one elementary school in Kunming now correspond with students at P.S. 205, across the street from the Bronx Zoo, about their mutual use of Pablo Python Looks at Animals. During the year they exchanged photos and letters in which they shared their feelings about wildlife and conservation. Zhang Lei from Wuhua School in Kunming wrote his pen pal in the Bronx: "Though we are from different places, we share a common wish. That is to protect animals."

Meetings also occurred in Kenya, where Ms. Berkovits and Curator of Education James Breheny were invited by the Kenya Wildlife Service to consult on educational programs and animal facilities for the planned Nairobi Safari Walk, which is being designed by WCS to replace the Nairobi Animal Orphanage, an outdated zoo on the border of Nairobi National Park. When completed, the Safari Walk will serve more Kenyans annually than visit all the country's national parks combined.

In Poland, the New York-based Kosciuszko Foundation sponsored the Bronx Zoo's energy curriculum, *Voyage from the Sun*, as a vehicle to teach English to Polish students at a UNESCO summer camp.

### ***National Programs***

New teachers were added throughout the country for all four Bronx Zoo national wildlife curriculums during the year: Pablo Python Looks at Animals (K-3); Habitat Ecology Learning Program, or HELP (4-6); *Voyage from the Sun* (4-9); and for Project WIZE (7-12). These national programs thus

*next generation*



reached about 50,000 new students, bringing the total to well over a million since WIZE first emerged in 1985. Major support for national dissemination came from the Samuel and May Rudin Foundation, which funded informational materials on all the programs.

Habitat Ecology Learning Program went through its first year of full-scale dissemination, beginning with a workshop hosted by Chicago's Brookfield Zoo in August 1995 and ending with another at Miami Central High School in June 1996. An intensive HELP training program for New York City teachers was launched in summer 1996 with major support from the Tiger Foundation.

Real tigers, which are severely endangered in nature, were the subject of a new program introduced to teachers in Fort Worth, Texas. When these materials, currently in development, are published in 1997, they will be used in the U.S. and Asia to reach children where environmental education is critical to tiger survival.

### Zoo-Based Programs

Multi-session school programs drew 29,885 students to the Bronx Zoo from the metropolitan area, an increase of 15 percent over 1995. Another 11,320 people participated in general audience programs, highlighted by the Zoo's second series of annual "Overnight Safaris" for families, which were filled to capacity. Many families came back for the second year and a new roster of activities that included "Animal Jeopardy" and "Dr. Zoo's Workshop." Other popular adult and family programs included "Gorillas: Going, Going...?", a talk on the status of gorillas in the wild by WCS assistant director for Africa Hilary Simons Morland, and "Breakfast with Butterflies," highlighting the Zoo's new Butterfly Zone. For "Teddy Bear's Picnic," 62 four- through six-year-olds brought their own teddy bears to the Zoo to "introduce" them to our live grizzly and polar bears. Children and their

teddies marched from AfricaLab to the Big Bear exhibit overlook to learn "bearly believable" bear facts and to eat honey treats.

A 16-year tradition of winning National Science Foundation (NSF) grants continued with support for an exciting new program called "WIZE Science Adventure." Based on the Zoo's award-winning school curriculum, Wildlife Inquiry Through Zoo Education, the program provided four weeks of summer activities at the Zoo for 30 seventh-graders from underserved schools in the Bronx and Manhattan. Starting in JungleLab and AfricaLab, the students learned how to use binoculars, cameras, field guides, video recorders, telethermometers, and other field biology tools as they took nature walks

through the Zoo. They examined the structure of feathers, compared the teeth of mammals and reptiles, and recorded their observations of gelada baboon behavior. A highlight for many was a trip to Coney Island for a behind-the-scenes tour of the Aquarium. Their participation will continue in the 1996-97 school year. Each student will be paired with a mentor from the Zoo's staff who will provide support for science fair activities and career counseling. The students will return to the Zoo during the academic year to observe scientists at work and for a career day and other special events. Parents of the students have been especially supportive of the program.

Bronx Zoo education dramatically inspired many teachers and students, including three classes from Eric S. Smith Middle School in Ramsey,

*Kids set up their tents near the Sea Lion Pool (right) and Instructor Stan Boots works with participants (below) in one of the Bronx Zoo's "Overnight Safaris."*





New Jersey, that came to the Zoo in May for a program called "Wildlife and People." After their visit, the students sold T-shirts and donated the \$250 they earned to the Zoo's Education Department so that other students might have the same valuable experience.

While 743 teachers across the country received training in Bronx Zoo curriculums, another 481 were trained at the Zoo itself. Much of this work was supported by the Charles Zarkin Memorial Foundation and the Geraldine R. Dodge Foundation. A new workshop series, "Spring into Science," brought 37 elementary schoolteachers to the Zoo on six consecutive winter Saturdays (one of them in the middle of a blizzard) to learn how social studies, mathematics, language arts, and other disciplines can be taught in conjunction with science and animal observation. Seven summer workshops were conducted for 241 teachers from around the U.S. Dawn Marie Cox, a teacher from John F. Kennedy Middle School in Rockledge, Florida, wrote, "I will definitely recommend this program because too often teachers do not know zoos can be learning environments. This program shows teachers how, what, and why learning should take place at the zoo."

In the area of public instruction, the Department's 300 volunteer docents, the Friends of Wildlife Conservation, conducted guid-



Above: Vice President for Education Annette Berkovits visited a middle school in Kunming, China, to observe a Wildlife Inquiry through Zoo Education (WIZE) class.

Left: Students in Poland learned English at a UNESCO camp using the "Energy Pyramid" created for the WCS program Voyage from the Sun.

Below: The newly published Habitat Ecology Learning Program (HELP), for intermediate grades, is now used in 27 states, the District of Columbia, and Puerto Rico.





Above: In Project BEACH, led by Assistant Director for Curriculum and Instruction Merryl Kafka, a class from Surfside School connected street drains and the ocean they empty into.

Right: Seventh-graders from JHS 303 studied marsh life as part of the Aquarium's Academy Program stressing careers in marine biology.



ed tours of the Zoo for 24,529 children from more than 500 school classes. They also spent close to 10,000 hours giving minitalks at exhibits and staffing biocarts at Africa Plaza, Zoo Center, the World of Reptiles, and the Children's Zoo. Behind the scenes, they observed the behavior of St. Vincent's parrots for the Bird Department and conducted visitor surveys for the Exhibition and Graphic Arts Department as part of the planning for the Congo Gorilla Forest now under construction. The Friends' Hospital Outreach Program reached more than 1,490 people in 41 hospitals and nursing homes in the metropolitan area.

The Department was assisted for periods from three to 12 months during the year by 22 teaching interns, most of them recent college graduates or post-graduate students exploring their interests in environmental education. They helped with school pro-

grams, summer camp programs, teacher training workshops, and family overnights. In reference to her own career goals, intern Lisa Spardel wrote, "I feel that I have had an invaluable experience at the Zoo, and I have gained much insight into wildlife and education. I have always felt that teaching was my calling in life, and I can now see a career in conservation education."

#### AQUARIUM EDUCATION

A new program enabled the education staff to instill conservation concepts in young students by linking hands-on, direct action with the study of coastal marine ecology. Project BEACH (Beach Ecology and Care of Habitats), funded by a grant from the New York State Department of Environmental Conservation, brought to the Aquarium two classes of third- and fourth-graders from P.S. 329 in Coney Island. While studying coastal marine ecology along the beach, the students actually helped to clean up the beach itself. By sorting, classifying, weighing, and charting the floatable debris they collected, they became completely sensitized to the need for habitat protection and community responsibility. They shared what they learned through poetry, posters, and sculpture they created to fill classrooms and hallways.

The City's Department of Cultural Affairs helped with another new program that reached out to children living in temporary housing. For one week, during the spring holiday, 20 children of ages six through eight participated in several three-hour multi-disciplinary sessions conducted throughout the Aquarium. They used simple scientific instruments such as thermometers and micro-

scopes, talked to keepers and trainers, learned to handle animals, kept journals of their observations, sang songs, and created murals. On the last day, parents and siblings were invited to join the students in the Ocean Festival, which featured costumed instructors and an Aquarium Fish Parade with music and songs emphasizing the connection between people and the environment.

The after-school and weekend Marine Teen Institute was continued with additional funding from the Altman and Pinkerton foundations, with 46 students, ages 13 through 15, attending from several public and parochial intermediate schools in Brooklyn. Second-year students capped their year-long studies at the Aquarium by writing the script, painting the sets, and working with a dramatic coach for their production of "A Few More Fish: A Fisherman's Story," in which the dangers to ocean fisheries were urgently presented. In addition to their coursework, first-year Marine Teens helped create the first computerized cetacean nutrition database.

With the support of Federal grants, 20 special workshops were conducted for teachers from five schools in the Bronx, Brooklyn, and Queens. Included were sessions on the local beach, in the marsh, and aboard the research vessel of CUNY's Kingsborough Community College. Aquarium support sessions at the schools will continue to reinforce the conservation themes introduced. An additional 40 workshops were conducted for teachers throughout the City.

For the first time, funding was provided for the Aquarium Docent Program, which attracts more than 200 students during the summer from 54 high schools and 12 colleges and universities. Thanks to the New York Community Trust, many students who could not participate due to economic hardship will now be able to do so, enabling the program to expand. Among our year-round adult docents, who now number 45, recognition for outstanding service was bestowed by New York City's Retired Senior Volunteer Program on "Shark Lady" Harriet and "Penguin Man" Pilch, who have contributed more than 3,000 hours. The department itself received an award for "Outstanding Teaching, Dedication and Service to Science Education" from the New York Biology Teachers Association.

#### **CENTRAL PARK WILDLIFE CENTER EDUCATION**

Last year, nearly 8,000 students participated in our school group programs and hundreds more in workshops. With the restructuring of Zoo School classrooms, it has been possible to serve a greater number of children through school programs and family workshops. Meanwhile, our volunteer Wildlife Guides, supervised by April Rivkin, gave tours to 3,796

people, read stories to 7,463 children, shared an activity or a conservation message with 61,810 visitors to the Wildlife Conservation Center (WCC), and logged 17,478 hours.

Preschool youngsters were the target of new weekday programs devoted to hands-on, sensory experience. Instructor Randi Winter developed "'Sense'sational World," which explores wildlife through the eyes, ears, noses, and paws of animals, and "Discovery Days," focusing on concepts of shape, color, and size in the animal world. Our ever-popular "KinderZoo," a three-day workshop, introduces animal habitats and, with the other two sessions, offers a wonderful prologue to learning about wildlife.

Wildlife Theater, on the east side of the Central Garden, put on several new presentations under coordinator John Fulweiler. "I am not a Penguin" features two gentoo penguin puppets, a crusty sea captain, a snooty waiter, and a penguin predator—a shark—in a show about adapting to life in Antarctica. "A Species Carol," based on Charles Dickens' familiar story, has ghosts of the past, present, and future of wildlife imploring Scrooge to change his ways, with special reference to problems of the animal skin trade.

At the Polar Zone, a roving actor playing Polar Bear Pappy portrays a gold rush explorer who shares with visitors stories about the life of animals in the Arctic. Visitors also have a chance to meet the people working behind the scenes through a series of talks. In the first presentation, Keeper Celia Ackerman shared her experience with the successful enrichment program, which has increased and enlivened the activities of the polar bears in their habitat.

*Charles Dickens' A Christmas Carol was replayed as A Species Carol by John Fulweiler at the Central Park Wildlife Center.*





*The public watches the sea lions being fed at the Prospect Park Wildlife Center (top), while a capybara, the world's largest rodent (above), enjoys a different kind of lunch.*

The educational birthday program launched by the Center and Linda Kaye's Birthdaybakers Partymakers offered young celebrants a safari adventure, breakfast with the penguins, or making a wildlife documentary. Thirty-three parties were held in the first two months of operation. Some 231 older youths enjoyed the new "Singles Night," devoted to animal courtship.

## QUEENS WILDLIFE CENTER EDUCATION

More than 6,000 students, predominantly from elementary schools in the City, attended 210 programs relating primarily to North American habitats and endangered species during the school year. Popular among the programs were "Magnificent Mammals," "Habitats around Us," "North American Wildlife," "Wild Diets," and "Wild, Rare, and Endangered."

Programs for Boy Scouts and Girl Scouts, including overnight excursions, drew 466 participants, a record. Over 200 three- to five-year-olds took part with their parents in "Kids to Kritters" programs during the spring and winter holidays.

Special events included "Howl-O-Ween" on October 27, 1995, and "Bison Bonanza" on June 22-23, 1996. Visitors enjoyed educational games, demonstrations, crafts, storytelling, and music in record numbers. On June 8, a breakfast event was

held for the Queens Community Boards and their families, updating local community leaders on the Center's resources.

One of those resources is a second classroom, built by the maintenance staff and opened in April near the Sea Lion Pool. The new facility helps accommodate expanding enrollment for all education programs.

## PROSPECT PARK WILDLIFE CENTER EDUCATION

A record enrollment of 6,552 students in 195 school programs and 97 participants in summer camp signed up during the year. Most popular among the new courses were "Native American Wildlife of New York City," "Reptiles and Amphibians," and "Wetlands." Two new birthday party themes—"Baboon Birthday" and "Barnyard Birthday"—were also extremely popular and featured regular guest appearances by keeper staff. After-school programs and Girl Scout overnights were added during the spring. During the winter and spring vacations, the Education Building itself was transformed into an exciting Discovery Center offering different family learning activities each day.

Three major events highlighted the year. Halloween Happenings in October included magic shows by Mr. R.E. Cycle, face-painting, arts and crafts, roving costumed characters, and pumpkin treats for the Hamadryas baboons. The spring season began in April with Linsey-Woolsey weekend, a joint effort with Lefferts Homestead, the historic house nearby in Prospect Park. At the Wildlife Center, children churned butter, raked hay, and watched the annual sheep-shearing; at Lefferts', they cleaned and carded wool that was then spun. The last event was Operation Conservation in June, a weekend of games ("Endangered Species Twister"), live animal demonstrations, and performances by Annie and the Natural Wonder Band.

Local community events included hosting an exhibition of Brooklyn illustrators for the borough-wide "Welcome Back to Brooklyn," and participating in "You Gotta Have Park," a celebration of Prospect Park. Our Children's Art Gallery was expanded to include schools from all over Brooklyn, which took part in monthly exhibitions showcasing artwork of the Wildlife Center's animal collection.

## WILDLIFE CONSERVATION MAGAZINE

"Spirit of Survival," the cover line on the March/April issue, perhaps best reflects the outlook for Wildlife Conservation as it enters its 100th year of publication. Two years ago, the magazine started on the road to fiscal solvency by instituting an austerity plan to rein in spending. This year, we reached the break-even point, with the largest savings realized from the suspension of costly direct-mail campaigns. Significant reductions were also achieved by implementing cutting-edge production technology without sacrificing quality. Under the leadership of the Magazine Committee, chaired by Trustee John Elliott, Jr., and comprised of other trustees and WCS

staff, the initial phases of a financially sound circulation-building plan and a five-year operating plan were launched. The magazine won ten national awards for design, including one gold and two silver Ozzie Awards.

The year's special May/June 1996 issue focused on wild cats, with articles by WCS research scientist K. Ullas Karanth, whose field studies in India are vital to the Society's Tiger Campaign; by WCS conservation biologist George Amato on the importance of genetics in cat conservation; and by Alan Rabinowitz, the Society's resident wild cat specialist. Three new departments made their debuts in the July/August 1995 issue: "From the Field," reported by WCS scientists from far-flung research sites; "Kids' Connection," for 6- to 12-year-olds; and "At the Zoo," featuring our member institutions. The magazine staff also produced the "Wildlife" visitor newspapers and guides to the Society's five New York facilities, as well as various WCS programs, advertisements, and other printed materials. The 1996 WCS *Saving Wildlife* calendar was published by Harry N. Abrams, Inc., with photographs by WCS Advisor Art Wolfe, text by Executive Editor Deborah Behler, and photo consultation by Art Director Julie Maher.

Two WCS publications reach hundreds of thousands of subscribers and visitors to the Society's five New York facilities.



*"We now recognize that protected areas cannot be isolated from the surrounding human populations and their activities"*

JOHN ROBINSON  
VICE PRESIDENT FOR  
INTERNATIONAL CONSERVATION



Above: Scarlet macaws fly over Madidi National Park, one of two areas in southeastern Bolivia recently protected with park status as a result of WCS Conservation Zoologist Andrew Taber's three years of work with the Bolivian National Diversity Office. Right: Taber and a baby peccary draw a crowd in Kaa-Iya del Gran Chaco National Park. The two parks together cover more than 20,000 square miles.

# *international*

All conservationists dream of the good old days when conservation was unambiguously simple. There was a time when our strategy was to understand the biological needs of wild species and to establish reserves and parks to minimize human impact in these areas. All this has now changed. It is not that we have to throw out our old approaches—parks and reserves are a necessity and still the cornerstone of our efforts. But we now recognize that protected areas cannot be isolated from the surrounding human populations and their activities. Conservationists are being asked to help define a mosaic of different land uses beyond parks that both protects natural systems and allows people to make a living. Only in such a mosaic, or "sustainable landscape," will we be able to save the nature to which we are dedicated.

To meet this challenge, the Wildlife Conservation Society increasingly brings additional expertise to bear. Where once we depended exclusively on our field biologists, we now include veterinarians, anthropologists, sociologists, educators, lawyers, and economists. To do conservation we must understand the nutritional requirements and health status of wild species. We must also know the socioeconomic constraints on rural peoples, their cultural traditions and rights to land and resources, who makes the money, and who controls the political power in a community, region, or country.

Much of our additional expertise comes from within WCS itself. New approaches include the Field Veterinary Program, which provides particular information about threats to species in nature. Our education program in China supplies infrastructure for our field scientists in Yunnan Province and raises awareness about tiger conservation throughout that country. Coral reef research at the Aquarium supports our efforts in Belize, Kenya, and Burma. The Bronx Zoo's Herpetology Department and other WCS staff have been involved in our Great Swamp project in New York State. The Science Resource Center has helped our coastal zone management program in Argentina.

We also worked closely on many projects with other international and local conservation organizations, including the World Wildlife Fund to identify critical tiger habitat around the world, Conservation International to describe the unique biodiversity of Papua New Guinea, and CARE and the Peregrine Fund to help the government of Madagascar implement its Masoala National Park. Only by drawing on this wealth of expertise can today's conservation challenges be met through concerted study, cooperation, and action.

## AFRICA

Many of the 76 WCS projects in Africa received major grants; and many worked collaboratively with other conservation organizations, regional groups, and local communities. Key projects in Gabon, Cameroon, and Tanzania were supported by the John D. and Catherine T. MacArthur Foundation and in Cameroon by the Liz Claiborne and Art Ortenberg Foundation. The Walt Disney Company Foundation backed nearly a score of African projects. Partner-

*conservation*



ships were also formed with the U.S. Fish and Wildlife Service, the U.S. Agency for International Development, the Global Environmental Facility of the United Nations Development Programme, the African Wildlife Foundation, the American Museum of Natural History, and several national conservation groups and universities.

Tanzania and Kenya were the sites of two major WCS events during the year. In September, WCS Africa staff and colleagues from the Tanzanian National Parks Service (TANAPA) met in Tarangire National Park. Discussions on training, inventory and monitoring, methods of working with local communities, and the

role of science in conservation enabled a productive interchange of information and technical skills and an integration of purpose among scientists working in forest, savanna, and coastal ecosystems.

The other event brought WCS trustees, advisors, and friends to Kenya and Tanzania in February for a centennial safari called "Footsteps Across Africa." The trip was celebratory and educational for the 113 travelers, who included WCS staff guides and were hosted by David Western, director of the Kenya Wildlife Service, and his former WCS colleagues: Patricia Moehlman, Helen Gichohi, Simon Mduma, Sebastian Chuwa, and Andrew Muchiru.

Helen Gichohi, director of the African Conservation Center (ACC) at WCS's headquarters in Nairobi, Kenya, continued to monitor wildlife in Kitengela and the Athi-Kapiti Plains. She also worked with David Campbell and Albert Mwangi on an integrated socio-economic and ecological study of land-use change in the southeast Kajiado District. Also out of the ACC, Andrew Muchiru is addressing the question of Amboseli National Park's degraded wetlands, with attention to how bushland, woodland, and marsh are affected by the feeding ecology of various animal species.

Tim McClanahan's long-range work with coastal habitats now encompasses eight coral reefs off the coast of Kenya and eight off Tanzania. Monitoring of the reefs includes experiments in removing sea urchin populations, which seems to be having some success in restoring biodiversity and fish-dominated habitats. Additional fieldwork by McClanahan on the ecology of marine snails off Madagascar and the Florida Keys and his participation in WCS's barrier reef project in Belize provided much-needed comparative data. A large number of conservation officers and students have received training in the program and are conducting independent research, some for graduate degrees at various universities, including South Carolina, Wisconsin, Newcastle-upon-Tyne, and Barcelona.

Three expeditions, led by Moehlman and Michael Klemens, were made during the year to Udzungwa Mountains National Park, Tanzania's newest national park, where biodiversity surveys were conducted by WCS, with support from Mrs. and Mrs. Joseph Cullman, in partnership with the University of Dar es Salaam, the Tanzanian National Parks, and the Serengeti Wildlife Research Institute. The team of international experts, also representing the American Museum of Natural History, the British Museum of Natural History, and the Field Museum of Natural History, is recording the complexity of wildlife in one of the country's few remaining rain forests. In western Tanzania, while observing two troops of red colobus monkeys, Shadrack Kamenya also explored the need to seek long-term solutions for hu-



Top: WCS field scientist Sebastian Chuwa was a guide in Tanzania for Footsteps Across Africa.

Above: Automatic cameras help census bongos in Congo's Nouabalé-Ndoki National Park.

Left: The Congo bay owl was rediscovered during a survey of Zaire's Itombwe Forest.





*The wide-ranging Coral Reef Project in Kenya (above and left) and in Tanzania is conducted by a team under WCS Associate Conservation Ecologist Tim McClanahan.*



man needs along the northern border of Gombe National Park. Conservation in the park is threatened by fuel- and firewood shortages in towns along Lake Tanganyika.

Projet Masaola in Madagascar is a collaboration with CARE, the Peregrine Fund, the Malagasy National Parks Association (ANGAP), and the Wildlife Department of the Ministry of Agriculture and Rural Development. Philip Guillery, Matthew Hatchwell, Vincent Razafimahatratra, Claire Kremen, and a team of Malagasy junior scientists are formulating and hoping to implement management plans for the new Masaola National Park and surrounding multiple-use zones, with special attention to harvesting "green-certified" timber, butterfly ranching, palmseed harvesting, and ecotourism—revenue producers that may ultimately help support biodiversity protection. Lantoniaina Andriamampianina returned to the project to work on invertebrates as biodiversity indicators after receiving her Masters in conservation biology from the University of Kent at Canterbury under a joint WCS/Durrell Institute of Conservation and Ecology grant for the professional development of African conservationists.

Leonard Mubalama, scientific park warden at Okapi Wildlife Reserve in Zaire, completed the same degree under this program and also continues to receive support as he resumes work in Zaire on the management of wildlife-human conflicts. Grauer's gorillas were the focus of several ongoing surveys, with backing from Edith McBean Newberry, in Zaire's eastern forests. Senior Conservation Zoologist John Hart, whose work is funded largely by the Robert Wood Johnson 1962 Charitable Trust, and Omari Ilambu of the Zairian parks department organized an expedition to the remote It-

ombwe Forest, where they found previously unknown populations of Grauer's gorillas and rediscovered the Congo Bay owl. Farther north, Jefferson Hall, Inogwabini Bila-Isia, Amy Vedder, and Bryan Curran ventured into the original sector of Kahuzi-Biega National Park to update census figures and to complete population and distribution estimates of Grauer's gorillas throughout their range.

The Nyungwe Forest Conservation Project (PCFN) managed to survive Rwanda's devastating war and is now reviving under the leadership of Eugene Rutagarama, with occasional assistance from Kurt Kristensen and Director for Africa Amy Vedder. Buildings damaged during the war have been repaired, and tourism is slowly returning to the area. The monitoring program compares flora and fauna before and after the war, and new research is being conducted to monitor vegetation following a widespread forest fire. The Zaire-Nile Divide Forest Commission was reinstated, with its first

postwar regional meeting being hosted by PCFN, which is also sponsoring a one-hour radio drama that relates the importance of Nyungwe to the local, national, and international community.

WCS efforts in Republic of Congo, spearheaded by Michael Fay, Matthew Hatchwell, Richard Ruggiero, and Bill Fanjoy, have resulted in considerable progress on a management plan for the recently created Nouabalé-Ndoki National Park and surrounding buffer zones. Biological inventories, ecological studies, and socioeconomic investigations, with support from the Pattee Family Fund, have been conducted to provide a scientific basis for the plan. With the acquisition of a Cessna 182, new techniques of aerial videography are being developed and have already been used to evaluate the impact of logging and other human activities on forest.

Matthew Hatchwell and Samba Douckaga are also participating in a Protected Area Conservation Strategy (PARCS) project to develop an operational training office and a training plan within Congo's ministry of water and forests. PARCS-Congo organized a series of workshops to train protected area managers and pro-

duced a series of written training materials, including a legal guide to Congolese protected area legislation. The PARCS project (which includes WCS, the African Wildlife Foundation, the World Wildlife Fund, and the Biodiversity Support Program) is also producing an illustrated training officer handbook to be distributed throughout Africa as a reference guide for developing formalized in-service training programs.

Another important publication, produced with support from the European Community, is Lee White's beautifully illustrated plant guide for the Lope Forest in Gabon. On sale in Lope, the book will help promote ecotourism there. White is also initiating a regional program to train African biologists in forest inventory techniques.

The WCS team in southeastern Cameroon completed a comprehensive research program in the mammal-rich forests of the Lobeke region. Robert and Cheryl Fimbel, with Leonard Usongo, conducted extensive biological surveys, including evaluations of the impacts of logging and hunting on the forest resource base. Bryan Curran and Lucie Zouya Mimbang established conservation

networks among local communities to address natural resource concerns, while also conducting socioeconomic assessments, including an investigation of the importance of bushmeat as a diet staple. An integrated report with recommended conservation strategies was submitted to the Cameroon government.

In March 1996, Banyang-Mbo Community Forest Reserve became the first new protected area to be declared in Cameroon in ten years. While WCS field scientists Dwight Lawson, Anthony Nchanji, and David Nzouango monitor the resource base and conduct community outreach, efforts are underway to enact joint management of the reserve by government and community members, with technical assistance from WCS.

## LATIN AMERICA

Many of the 41 WCS projects in Central America come under the aegis of Paseo Pantera, or Path of the Panther. Conceived in 1990, the program is a far-sighted effort to

develop a "biological corridor" through the seven nations of the isthmus. Regional Coordinator Archie Carr III is now working with a WCS team that includes Conservationist James Barborak, Director for Latin America Alejandro Grajal, and founder of the Costa Rican national park system Mario Boza. The renewed initiative, with funding from Robert W. Wilson, is supported by CONCAUSA, the treaty between the United States and the countries of Central America signed at the 1994 Presidential Summit of the Americas in Miami.

The corridor begins in Belize, where WCS's long-term research on the 150-mile reef continues under Janet Gibson and Jacque Carter. The WCS field station on Middle Cay receives continuing support from Lady Kinnoull's Trusts and is now directed by James and Maureen Powell. A new research vessel, the "Meddy Bemps,"



*Southern fur seals and other coastal wildlife are being studied and protected through WCS efforts in Peru (right) and Argentina (above), where Field Vet Billy Karesh (left) and Chief Vet Bob Cook (right) conducted health surveys with Associate Conservation Zoologist Claudio Campagna (center).*





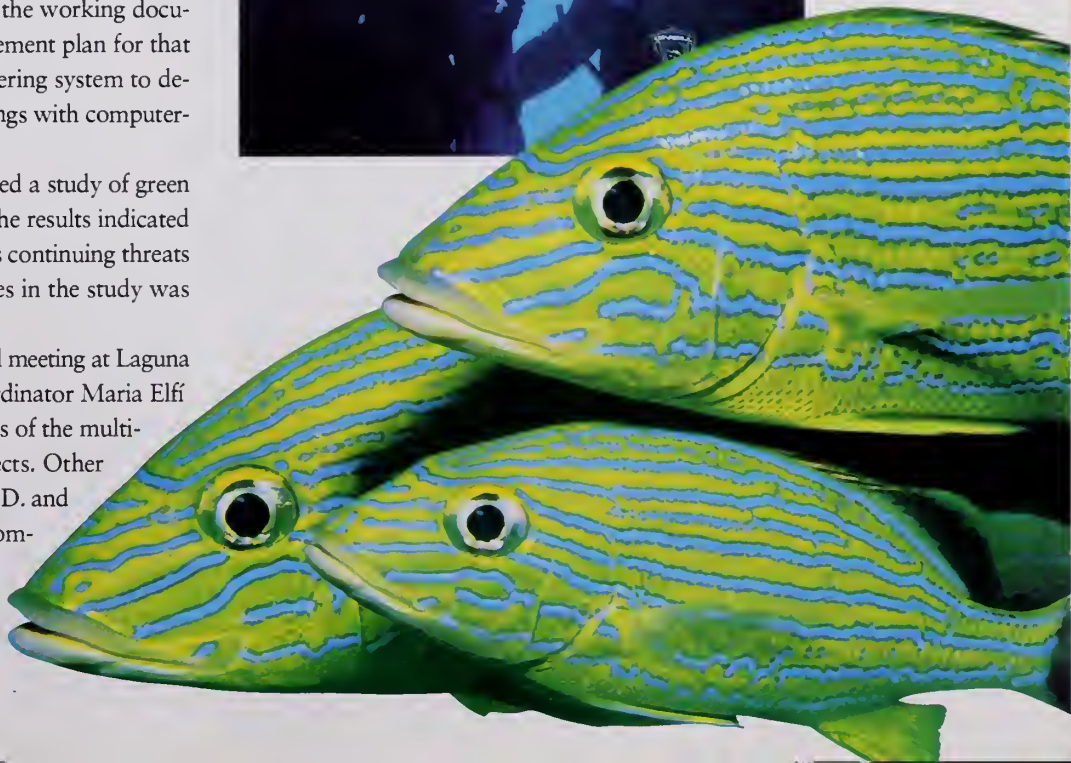
*At the Belize Coral Reef, Maureen Powell videotapes (above) and Tim McClanahan and John Robinson explore (right) the diverse underwater life, which includes blue-striped grunts (below).*

was donated to the station by Eugene Phipps. Tim McClanahan's working visit to the Cay provided him with important data to compare with his work in Kenya and Tanzania.

Bruce and Carolyn Miller completed their documentation of Belize's biodiversity and zoogeography for the National Protected Area Management Project, which may become the working document to develop a national park service management plan for that country. The Millers have also created a pioneering system to detect and census bats based on matching recordings with computerized voice signatures for known species.

In Panama, Anne and Peter Meylan completed a study of green sea turtle migrations using satellite telemetry. The results indicated previously unknown migratory routes as well as continuing threats to all sea turtle species, as one of the two turtles in the study was killed by a Panamanian fisherman.

The Latin American program held its regional meeting at Laguna La Cocha, Colombia, giving WCS country coordinator Maria Elfi Chaves an opportunity to report on the progress of the multi-faceted conservation training program she directs. Other WCS activities in Colombia, assisted by the John D. and Catherine T. MacArthur Foundation and Colombian partner groups, include Carolina Murcia's and Gustavo Kattan's study of how habitat fragmentation affects biodiversity in the Andes,



Jamie Cavelier's work with students on the status of the elusive Andean mountain tapir, and Mirian Lugo's countrywide survey of the endangered Orinoco crocodile, the first one completed in 20 years.

Negotiations among government agencies, universities, and environmental groups are under way in Venezuela to establish a national biodiversity strategy. WCS Director for Latin America Alejandro Grajal has been instrumental in the process, which has been bolstered by a series of training workshops directed by José Ochoa and sponsored by the new conservation association ACOANA, to improve coordination among government agencies dealing with biodiversity protection. On Margarita Island, the parrot recovery run by the non-governmental organization PROVITA recorded an increase in nest cavities, more hatchlings, and fewer fledglings lost to illegal sales. PROVITA also published the long-awaited and lavishly illustrated Venezuelan Red Data Book of endangered and threatened species.

As the development of a long-range management plan began for the Mamirauá Ecological Reserve in central Brazil, the Brazilian National Science Academy declared the project, under WCS Senior Conservation Zoologist Márcio Ayres, as the National Institute of the Varzea, the country's 11th major scientific research institute. This represents a commitment by the government to finance conservation in the unique flooded forest and in the Amazonian Basin in general. Carrying forward the Mamirauá plan, Assistant Director for Latin America John Thorbjarnarson began a three-year program on aquatic turtles and caiman. With funding from the European Union, he will work with Brazilian students to develop conservation strategies for some of the most endangered, but economically valuable species in the Amazon.

For his direction of the Mamirauá project, Ayres was awarded the Agosto Ruschii Prize, which is given every four years by the Brazilian Academy of Sciences. Also in Brazil, the Top de Ecologia was awarded to Pedro Lima, who has been working with WCS Senior Conservation Zoologist Charles Munn and the Brazilian conservation group CETREL to protect the last remaining populations of the Lear's macaw.

Due to Munn's work with the Machiguenga Indians in Peru, in conjunction with the conservation group CEDIA and supported by the Liz Claiborne and Art Ortenberg Foundation, much of the lower Urubamba River is now held in land titles by the Machiguenga, which will prevent further colonization of the region. Plans for a low-impact tourism lodge in the lower Manu River are also being developed with local communities. In coastal southern Peru, Associate Conservation Zoologist Patricia Majluf led a team of researchers in the first survey of all the wildlife concentrations on areas colonized by seabirds. She also organized an international meeting in Washington, D.C., on the biology and conservation of seals and was the recipient of the Women in Conservation Award of the Wyman Trust.

Conservation Zoologist Andrew Taber's three years of work with the Bolivian National Biodiversity Office and several indigenous groups was rewarded in October with the declaration of two major national parks in the Chaco region of southeastern Bolivia. More than 13,000 square miles of one of the last remaining ecologically intact sections of the Gran Chaco dry forest was set aside as the Kaa-Iya del Gran Chaco National Park, which potentially has more mammal species (excluding bats) than any other Latin American reserve. Also decreed by the Bolivian president was the Madidi National Park and Protected Area of more than 7,000 square miles, which includes a wide range of habitats from Amazonian lowland rain forest and savannas to cloud forest and snow-covered peaks. WCS support of the Bolivian conservation organization EcoBolivia and the work of Charles Munn played key roles in protecting these areas.

The Patagonian Coastal Management Plan, funded by the Global Environmental Facility (GEF) of the United Nations Development



*Tim O'Brien and Margaret Kinnaird are working to establish a national park on Indonesia's island of Sulawesi to protect black crested macaques (right), now being used up as a food source, and red-knobbed hornbills (above, being measured by Kinnaird and team).*





Programme, completed its third year under William Conway, Graham Harris, Claudio Campagna, and the Fundación Patagonia Natural, surveying coastal wildlife and monitoring the effects of pollution and tourism on biodiversity. Conway and Alejandro Grajal met for the third time with representatives of the government and the U.N. to plan and ensure the future of the program, which is widely viewed as a model of coastal-zone management and community-based conservation action. Conway and Grajal also organized the first conference, hosted by WCS at the Central Park Wildlife Center, on conservation in the southwest Atlantic, a meeting that included biologists working in Argentina and the Malvinas Islands.

## ASIA

WCS's 59 field projects in Asia stretched from the Tibetan Plateau to the island nation of Papua New Guinea, several with major funding from the John D. and Catherine T. MacArthur Foundation and the Liz Claiborne and Art Ortenberg Foundation. In Southeast Asia, the dramatic opening of several countries to conservation has been accomplished through the efforts of Alan Rabinowitz and through the survey visits of Rabinowitz and Director for Science George Schaller to Myanmar, Lao P.D.R., and Vietnam. New activities in the area have been greatly facilitated by Rabinowitz's field training sessions and a techniques manual, now translated into Mandarin Chinese, Bahasa Malay, Thai, Burmese, and



Above: During their wildlife surveys in Laos, Salisa and Alan Rabinowitz, with George Schaller, talked extensively with villagers, here along the Vietnamese border, to confirm locations and determine local use of wild resources. Left: The Rabinowitzes' colorful book on tigers and other wild cats of Southeast Asia has become a best-seller in Thailand.

Khmer, and by regional workshops, first in Kunming, China, then, last August, in Bangkok, involving officials from Cambodia, China, Lao P.D.R., Malaysia, and Thailand.

Lao wildlife surveys begun by Schaller and Rabinowitz have been coordinated since December 1995 by Bill Robichaud and are now complemented by the work of Michael Meredith on community-based protected area management. In Myanmar, while Steve Monfort studied the ecology of dwindling Eld's deer populations, Saw Tun Kaing succeeded Tint Lwin Thaung as coordinator of wildlife surveys and training. The Thailand program focused pri-

marily on carnivores, with Kathy Conforti in Huai Kha Kaeng/Thung Yai Wildlife Sanctuary and Antony Lynam in Peninsular Thailand. Meanwhile, a Thai-language book on wild cats by Alan and Salisa Rabinowitz has become a best-seller in the country.

Another WCS transnational effort, the Tiger Campaign, was launched on behalf of the five remaining tiger species throughout Asia. A major financial boost for the project was provided by MCG HealthCare (Gary Fink, Chairman) through its "Hold That Tiger Campaign," and by Sandra K. Lerner through the L.X. Bosack and B.M. Kruger Foundation. Included is the work of Ullas Karanth in India, the Hornocker Wildlife Research Institute in eastern Russia, Le Xuan Canh in Vietnam, and Margaret Kinnaid and Tim O'Brien, who have established a station in Sumatra.

WCS's third policy report—*Saving the Tiger: A Conservation Strategy*—laid the foundation for the Tiger Campaign, identifying, among other things, high priority tiger conservation areas where immediate efforts need to be focused. This assessment, devised jointly with World Wildlife Fund-US, was funded by and produced to advise the National Fish and Wildlife Foundation's Save the Tiger Fund, which was established in 1995 with a \$5-million contribution by the Exxon Corporation. The policy report's design won the Gold Medal of Excellence at the Neographics Award Competition.

A new two-year effort, funded by the Cline Family Foundation, was launched in China to reduce consumer demand for tiger products, and a similar six-month pilot project was begun in New York City's Chinese communities. A powerful impact has already been achieved by the Save the Tiger advertising campaign, developed and implemented in Asia for WCS by Ogilvy & Mather-Worldwide. Selected from over 10,000 competitors from 70 countries, the cam-

paign won Best Public Service Print Campaign in the London International Awards, and also won the Singapore awards, gold medal and finalist awards in the New York Festivals, and the Awards of Excellence by Communication Arts for both print and television.

In June 1996, WCS Senior Policy Analyst Dorene Bolze testified before a House subcommittee in favor of increasing appropriations for the African Elephant Conservation Fund and the Tiger and Rhino Conservation Fund. She also argued that it is time for the United States to focus on its own role as a consumer nation and urged the House to support a bill in the Senate that would rectify an oversight in the Endangered Species Act that does not expressly prohibit the sale of Asian traditional medicines that are labeled as containing tiger, rhino, and other endangered species as ingredients. If passed, this bill would bring U.S. law on these products in line with the laws of many Asian consumer countries, including those, such as China and Taiwan, which the U.S. had successfully pressured to improve their legislation on these issues.

Expansion of the WCS education program in China, which bolsters its field operations as well, is reported in an earlier section (page 20). George Schaller conducted a major biodiversity study in southeastern Tibet with Liu Wuilin of the Tibet Forest Bureau and Wang Xiaoming of the East China Normal University in Shanghai, covering some 40,000 square kilometers. An overview of wildlife demography was obtained, the conservation message spread, and a population of Tibetan herdsmen, possibly the last existing one of substantial size, was rediscovered. Schaller also visited the Kamchatka Peninsula of far eastern Russia, where he helped William Leacock get started on a three-year study, supported by the Gilbert and Ildiko Butler Foundation, of the ecology and management of the brown bear, which has drastically declined from a population of 30,000 early in this century, primarily due to hunting.

Backed by the Armand G. Erpf Fund, Kinnaid and O'Brien completed all research associated with the Sulawesi Rainforest Project, submitted their final report to the Indonesian Academy of Science, and wrote a draft management plan for the Tangkoko-Dua Sudara Nature Reserve, suggesting it be redesignated a national park. One result was the publication of Kinnaid's *North Sulawesi: A Natural History Guide* in Indonesian and English. Their work continued, with the Indonesian Ministry of Forestry and BirdLife International, on the Sumba Island Forest surveys, evaluating canopy structure, fig density, and cavity nest sites for Sumba Island hornbills, the world's rarest hornbill species, and citron-crested cockatoos. They are advocating two national parks and four nature reserves to help preserve the island's remaining forest tracts.

Assisted by Adrian Nyaoi and Jephthe Sompud, Senior Conservation Zoologist Elizabeth Bennett completed her extensive fieldwork on the impact of hunting in Malaysian Borneo, then published a preliminary report titled "A Conservation Management Study of Wildlife Hunting in Sabah and

Ullas Karanth (left) and his colleagues gather crucial data about endangered tigers in India with the use of radio-collars.





Sarawak.” Their findings show that hunting is depleting wildlife in all 17 survey sites, indicating the need for new conservation strategies and community involvement throughout the two states.

In Papua New Guinea, the unique involvement of local landowners in the management of Crater Mountain Conservation Area has had interesting effects, including the decision to forego contracts with logging companies. WCS coordinator John Ericho was able to point out, during an instructive trip in August 1995, how devastating logging activities can be in the forest. WCS and the Research and Conservation Foundation of Papua New Guinea began a three-year series of projects concerning biodiversity as well as local economic development. Debra Wright succeeded Chris Filardi as leader of the survey team at five different sites in Crater.

**NORTH AMERICA**

WCS has renewed its involvement over the past two years in North American conservation efforts, from Alaska and the Pacific West to eastern Canada, New York, and New England, helped in part by a grant from the Geraldine R. Dodge Foundation. In 21 projects



Above: Diane Murphy, Michael Klemens, and Angie Hodgson seine Hiller Brook, a tributary of the Great Swamp in Pawling, to determine the number and species of fish life.  
Left: Klemens studies a darter and baby bass from the collection. WCS is leading a cooperative effort, with local citizens and expert personnel, to manage the resources of this mostly privately owned 42,000-acre area of swamp and catchment, the largest such area in New York State.

during the year, the Society conducted research and provided technical assistance and scientific data to local conservation partners and government agencies who might not otherwise have the resources of personnel to do research and fieldwork.

In the northern Rockies of Montana and British Columbia, WCS Research Associate John Weaver is developing a non-intrusive new technique to accurately census lynx populations and track their movements. Working with government land management agencies in the U.S. and Canada, Weaver is collecting wild lynx hairs from a network of scented rubbing posts, and the hair is being fingerprinted for DNA by WCS geneticist George Amato in order to identify

individual lynxes. Ultimately, the procedure being developed here could lead to a better understanding of densities and movement patterns for many large carnivore populations.

Large predators, grizzly bears and wolves, are being studied by Joel Berger and Carol Cunningham to determine how they affect moose and elk populations in the Talkeetna Mountains of Alaska, where they have been present for a long time, and in the Teton region of the Great Yellowstone Ecosystem, where they have only recently returned. This research, which is supported by Mr. and Mrs. Leonard Stern, will be important in predicting how ecosystems may respond to the restoration of large predators at other sites in North America.

Conservation dialogue in New York State's Adirondack Park has been improved considerably by the Oswegatchie Roundtable, organized by WCS for local citizens, private timber company officials, government agency personnel, and environmental organization members. From discussions led by Director for North America Bill Weber, WCS has been designated leader of the Cooperative Stewardship Research Initiative, which will focus on the least developed northwestern quadrant of the park. In this area, Peter Houlihan is studying the role of the beaver in promoting habitat

heterogeneity in northern forests and providing wetland habitat for bird and amphibian species. On private timberlands of the Adirondacks, Rob and Cheryl Fimbel and Jerry Jenkins have begun to look at the problems of defining and implementing sustainable forestry practices, and how forest management plans are affecting biodiversity in the region.

In the Berkshires of Massachusetts and Connecticut and the Taconics of New York, Alison Whitlock and Michael Klemens, with support from the Geoffrey Hughes Foundation, continue to provide critical information on habitat requirements that will help to develop an effective recovery plan for the endangered bog turtle. Klemens' work has expanded to encompass the Great Swamp, a 4,800-acre wetland within a 42,000-acre watershed in New York's Putnam County. This project has enlisted the help of staff from WCS's Science Resource Center, curatorial departments, Animal Health Center, Education Department, and other divisions, as well as local organizations and community members to survey populations of amphibians, reptiles, fish, birds, mollusks, and insects, with the ultimate aim of designing an ecosystem management plan that will incorporate wildlife conservation into regional development planning.

WCS has succeeded in gaining international controls on the pet trade in turtles, but now we are concerned with how the U.S. Fish and Wildlife Service is dealing with continued exports of box turtles from North America. Last year, the Service had set a provisional export level of almost 10,000 box turtles from Louisiana based on practically no scientific data. So this year, working with Michael Klemens, who first identified this problem, we scored a major success by convincing the U.S.F.W.S. to allow no exports of the species.

Along the Atlantic fisheries, dusky and sandbar sharks have declined by over 80 percent in the last ten years and will not recover under current fishing regulations. As a member of the six-member Ocean Wildlife Campaign, with support from the David and Lucile Packard Foundation and the Pew Charitable Trusts, WCS has been working to reduce the allowable catch of sharks by at least 50 percent, developing products to help enforce laws against finning sharks, and planning the first international controls on shark exports, which are predominantly fins for Asian markets. The Campaign has also engaged in debates over the official assessment models for the Atlantic bluefin tuna and the swordfish, both of which are in steep decline because of over-exploitation and mismanagement.

Thankfully, Congressional bills to drastically gut the Endangered Species Act died as the result of a strong backlash from the public and moderate Republicans. Efforts by WCS, especially William Conway's meetings with House Speaker Newt Gingrich, were instrumental in turning the tide. While the moratoriums on listing species under the Act and similar extreme measures have been lifted, the movement of progressive legislation in this area would have to wait until the next session of Congress.

*Lynx populations are being censused by John Weaver in the Rockies of Montana and British Columbia.*





*Water buffalo are part of the wildlife diversity studied by Richard Ruggiero and his WCS colleagues in the Congo Forest Conservation Project.*

## AFRICA

### BOTSWANA

1. Effects of elephants on woodland habitats. Raphael Ben-Shahar.

### CAMEROON

2. Conservation and community participation in Banyang-Mbo Forest Reserve. Anthony Nchanji, Dwight Lawson, David Nzouango, Bryan Curran.
3. Ecology and conservation of forest elephants. Anthony Nchanji, James Powell.
4. Forest surveys and strategic planning in the Lobéké region. Cheryl Fimbel, Robert Fimbel, Leonard Usongo.
5. Reptile and amphibian ecology and behavior. Dwight Lawson.

### CENTRAL AFRICAN REPUBLIC

6. Dzanga forest elephant demographics and social dynamics (WCS/USFWS). Andrea Turkallo, J. Michael Fay.

### CONGO REPUBLIC

7. Congo Forest Conservation (WCS/USAID, GEF). J. Michael Fay, Marcellin Agnagna, Richard Ruggiero, Jerome

Mokoko, Bill Fanjoy.

8. Biological surveys, monitoring, and research in Nouabalé-Ndoki National Park (WCS/GEF). J. Michael Fay, Marcellin Agnagna, Richard Ruggiero, Steve Blake.
9. Conservation education and NGO liaison (WCS/USAID) WCS Congo Staff.
10. Protection for important elephant populations (WCS/USFWS). J. Michael Fay, Richard Ruggiero, Michellin Agnagna.
11. Mbeli bai gorilla social dynamics and ecology (WCS/Busch Gardens). J. Michael Fay, Claudia Olejniczak.
12. Protected Area Conservation Strategy (PARCS): Training managers (WCS/WWF/WWF/BSP/USAID). Samba Douckaga.

### ERITREA

13. Mangrove ecology and restoration. Sahlu Gebr Egziabihier.

### ETHIOPIA

14. Conserving biodiversity in Omo Conservation Area. Catherine Schloeder, Michael Jacobs.
15. African wild ass research and conservation. Fanuel Kebede.

### GABON

16. Research and training for management of Lopé Forest (WCS/ECOFAC). Lee White.
17. Impacts of logging on forest flora and fauna. Lee White.
18. Forest history and dynamics and their implications for management in Lopé Forest Reserve. Lee White.

### GHANA

19. Game warden training in wildlife monitoring (WCS/USFWS). Richard Barnes.
20. Conserving endangered primates in southwest. John Oates.

### IVORY COAST

21. Manatees, coastal mangrove conservation, and education. Kouadio Akoi.

### KENYA

22. Ecological monitoring of Amboseli National Park. David Western.
23. Resource economics in wildlife conservation. Albert Mwangi.
24. African Conservation Centre (ACC)—Development of a national NGO. Helen Gichohi.
25. Wildlife distribution and habitat use in Kitengela Corridor: Nairobi National Park and the

Athi-Kapiti Plains. Helen Gichohi.

26. Masai Mara Working Group. Helen Gichohi.
27. Habitat rehabilitation of Amboseli wetlands. Andrew Muchiru.
28. Coral reef research and conservation. Tim McClanahan.

### MADAGASCAR

29. Masoala National Park and community forest zone management (WCS/CARE/ANGAP/DEF/Peregrine Fund/Stanford Center for Conservation Biology/USAID). Clare Kremen, Philip Guillery, Vincent Razafimahatratra.
30. Phylogenetic relationships of the four endemic tortoises of Madagascar. George Amato, John Behler, Adalgisa Caccone.
31. Biodiversity inventory and professional training. Clare Kremen, Vincent Razafimahatratra.
32. Ruffed lemur taxonomy and conservation (WCS/AMNH). Hilary Simonds Morland, George Amato, Rob deSalle.

### NAMIBIA

33. Behavioral ecology and conservation of black-faced impala in

Kaokaland. Wendy Green, Aron Rothstein.

#### NIGERIA

34. Ecology, history, and management of Okomu Forest Reserve. Zeena Tooze.
35. Survey and preliminary status of Sclater's guenon. John Oates.
36. Status of primates and forests in eastern Nigeria. John Oates.

#### RWANDA

37. Nyungwe Forest Conservation Project: Ecotourism, education, inventory, and monitoring. Eugene Rutagarama, Amy Vedder.
38. Mountain gorilla population monitoring. Amy Vedder.

#### SIERRA LEONE

39. Potential of sacred groves for biodiversity conservation. Aiah Randolph Lebbie.
40. Ecology and conservation of white-necked picathartes. Hazell Thompson.

#### SOUTH AFRICA

41. Cape parrot ecology and status. Colleen Downs (for Olaf Wirminghaus).

#### TANZANIA

42. Social organization, resource use, dispersal, genetics, and disease in jackals. Patricia Moehlman.
43. Biodiversity assessment and the development of professional capacity in national parks (WCS/University of Dar es Salaam). WCS Staff, Alfeo Nikundiwe.
44. Training and conservation education. WCS Staff.
45. Vegetation mapping and herbarium development in national parks. Sebastian Chuwa.
46. Red colobus population dynamics and conservation, Gombe Stream National Park. Shadrack Kamenya.

#### UGANDA

47. Wetlands refugia for indigenous fishes. John Olowo, Lauren Chapman.
48. Selective logging impacts, Budongo Forest. Andrew Plumptre.
49. Role of elephants in tree regeneration. Erica Cochrane.
50. Primate dispersal and conservation, Kibale Forest. William Olupot.
51. Recovery of plant and animal communities, Kibale Corridor. Colin and Lauren Chapman.

#### ZAIRE

52. Ituri Forest Research and Training Center (CEFRECOT). Terese Hart, John Hart, and Robert Mwinyihali.
53. Large-mammal and human-impact surveys of the Okapi



Carel van Shaik studies orangutans and teaches conservation at Suaq Balimbing Swamp in northern Sumatra's Gunung Leuser National Park.

- Wildlife Reserve. John Hart, Faustin Bengana.
54. Large-mammal crop damage and management. Leonard Mubalama.
55. Comparative forest dynamics and botanical inventories using large plots. Terese Hart, Bola M. Lokanda, Innocent liengola, Makana Mekombo.
56. Socio-economic surveys and community participation, Okapi Reserve. Bryan Curran, Richard Tshombe, Kambale Kisuki.
57. Grauer's gorilla census and eastern forest large mammal surveys. Jefferson Hall, Inogwabini Bila-Isia, Omari Ilambu, John Hart, Amy Vedder.
58. White rhino monitoring in Garamba National Park. Kes Hillman Smith.
59. Congo peacock survey. Agenoga Upoki, John Hart.
60. Impact of subsistence hunting on wildlife populations and implications for sustainability. Richard Tshombe, Kambale Kisuki, Bryan Curran.
61. Grauer's gorilla genetic analysis. Kristin Saltonstall.
62. Health assessment and monitoring of free-ranging mammals.

William Karesh, Kes Smith, Mbayma Atalia.

63. Forest duikers: Feeding ecology, social behavior, and predator-prey relations. John Hart.

#### ZAMBIA

64. Nyamaluma Community-based Training and Land Use Planning/ADMADE (WCS/USAID). Dale Lewis.
65. ADMADE Safari Lease Agreement (WCS/WWF/USAID). Thomas Ankersen, Richard Hamann, and University of Florida School of Law.

#### REGIONAL

66. Protected Area Conservation Strategy (PARCS) Training Program (WCS/WWF/WWF/BSP/USAID). Annette Lanjouw, Matthew Hatchwell, Samba Douckaga, Emmanuel Pouna, Hilary Simons Morland.
67. African wild ass surveys in Ethiopia, Somalia, and Eritrea. Patricia Moehlman.
68. Regional internship program in African coral reef ecology and management (WCS/USAID). Tim McClanahan.
69. Methods for forest elephant surveys in Central Africa. Richard Barnes.
70. Socio-economic assessments

and local community participation in African forests. Bryan Curran.

71. Assessment of Rhino Conservation Strategies (WCS/WWF). Nigel Leader-Williams, Holly Dublin, John Robinson.
72. Regional training and inventory program in central African forests. Lee White.
73. Trinational monitoring (WCS/WWF/USAID). J. Michael Fay.
74. Postgraduate training and professional development (WCS/DICE/Darwin Initiative). Michael Klemens, Richard Griffiths, Hilary Simons Morland, Terese Hart, Claire Klemen.
75. Field methods manual for conservation of African forests and wildlife. Lee White, Annette Lanjouw.
76. Nutritional analysis of food composition for African mammals, birds, and reptiles. Ellen Dierenfeld, Bonnie Raphael, William Karesh, et al.

#### ASIA

##### CHINA

77. Tibet Autonomous Region wildlife surveys and reserve planning. George Schaller.
78. Small grants management pro-

- gram. Ji Weizhi.
79. Conservation project integration, Kunning Institute of Zoology. Ji Weizhi, Qui Ming Jiang.
  80. Conservation education. Annette Berkovits, Thomas Naiman.
  81. Panda conservation. Lu Zhi.
- INDIA
82. Carnivore ecology, Nagarhole National Park. Ullas Karanth.
  83. Country-wide tiger surveys. Ullas Karanth.
  84. Survey of the Indian great black woodpecker, Western Ghats. V. Santharam.
  85. Conflict between local communities and a wildlife sanctuary, Kerala. Sultana Bashir.
  86. Ecology of seed dispersal in the lion-tailed macaque. R. Krishnamani.
  87. Rainforest land tortoise. B.K. Sharath.
  88. Effects of non-timber forest product extraction. Aditi Sinha.
  89. Migrant bird ecology. Madusudan Katti.
  90. Avian parasite analysis. Susan Rothenberg.
  91. Using microsatellite markers to census tigers in India. George Amato, Ullas Karanth.
- INDONESIA
92. Tropical ecology of northern Sulawesi. Margaret Kinnaird and Tim O'Brien.
  93. Orangutan research and conservation training. Carel van Schaik.
  94. Habitat analysis for Sumba Island hornbill and citron-crested cockatoo. Margaret Kinnaird, Tim O'Brien.
  95. Ranging patterns of Sulawesi red-knobbed hornbills. Suer Suryadi.
  96. Genetic diversity in free-ranging orangutans. William Karesh.
- LAOS
97. Conservation training and integrated management of protected areas. Asia Staff.
  98. Wildlife surveys for key protected areas. Alan Rabinowitz, George Schaller, Rob Timmins.
  99. Training in protected area management. Bill Robichaud.
  100. Community conservation-education. Michael Meredith.
- MALAYSIA
101. Wildlife Master Plan, Sarawak. Elizabeth Bennett, Alan Rabinowitz, John Robinson.
  102. Research and management training. Elizabeth Bennett.
  103. Sumatran rhino, elephant, and banteng surveys, Sabah. Ramesh Boonratana.
  104. Effect of logging on the Malay civet, Sabah. Christina Colon.
  105. Conservation status of forest birds. Charles Francis.
  106. Ecological study and management of game species, Sarawak and Sabah. Elizabeth Bennett, Jephthe Sompud.
  107. Effects of hunting on forest wildlife. Elizabeth Bennett and Adrian Nyaoi, Jephthe Sompud.
- MONGOLIA
108. Gobi Desert research and conservation. George Schaller.
  109. Snow leopard ecology. Thomas McCarthy.
- MYANMAR
110. Wildlife surveys. Alan Rabinowitz, George Schaller.
  111. Coordination and training programs. Saw Tung Khaing, Alan Rabinowitz.
  112. Wildlife research small grants program. Tint Lwin Thuang.
  113. Establishment and management of Lampi Island Marine National Park. Alan Rabinowitz, Tint Lwin Thuang.
- PAPUA NEW GUINEA
114. Crater Mountain management. Christopher Filardi.
  115. Crater Mountain rural development. David Gillison.
  116. Conservation biology training/small grants. Christopher Filardi.
  117. Palm cockatoo research. Donald Bruning.
  118. Wild canid ecology. Robert Bino.
  119. Landowner relations. John Ericho.
  120. Megapode ecology. Ross Sinclair.
  121. Monitoring amphibian species. David Bickford.
  122. Crater Mountain wildlife survey. Deb Wright, Andrew Mack.
  123. Study of antlered flies as biological indicators. Gary Dobson.
- RUSSIA
124. Tiger research and conservation in Far East. Hornocker Wildlife Research Institute.
  125. Turtle ecology and conservation. Olga Leontyeva.
  126. Kamchatka Peninsula brown bear study. Bill Leacock, George Schaller.
- THAILAND
127. Small carnivore research in Huai Kha Khaeng/Thung Yai Wildlife Sanctuary. Saksit Sinichareon, Kathy Conforti.
  128. Habitat fragmentation and forest animals. Antony Lynam.
  129. Resource partitioning among turtles. Peter Paul van Dijk.
- VIETNAM
130. Tiger surveys. Le Xuan Canh.
- REGIONAL
131. Trans-boundary biodiversity conservation conferences. Alan Rabinowitz.
  132. WCS Tiger Campaign. Alan Rabinowitz, Dorene Bolze.
  133. Molecular phylogenies of Central Asian bovids and Asian pigs. George Amato, George Schaller, Colin Groves.
  134. Nutrient analyses of food in wild, Asian mammals and birds. Ellen Dierenfeld, Marianne Fitzpatrick, Penny Kalk, et al.
- LATIN AMERICA
- ARGENTINA
135. Natural history and wildlife conservation. William Conway.
  136. Patagonian Coastal Zone Management Plan (WCS/FPN-GEF/UNDP). William Conway, Guillermo Harris, Claudio Campagna, Fundación Patagonia Natural.
  137. Ecology and conservation of the Magellanic penguin. Dee Boersma, Pablo Yorio.
  138. Ecology and conservation of marine mammals in Península Valdés. Claudio Campagna.
  139. Natural history of Patagonia, conservation strategies, and Península Valdés station management. Guillermo Harris.
  140. Ecology and conservation of marine birds. Pablo Yorio.
  141. Punta Leon seabirds and mammals. Pablo Yorio, Claudio Campagna, Guillermo Harris.
  142. Pollution impact on Magellanic penguins. Esteban Frere, Patricia Gandini.
  143. Veterinary intervention and monitoring. Robert Cook, Claudio Campagna, William Karesh, Mirtha Lewis, Marcela Uhart.
- BELIZE
144. Reef fisheries research. Jacque Carter, Janet Gibson.
  145. Conservation of biodiversity. Jeanette Bider, Vernon Card, Douglas James.
  146. Nesting ecology, food habits, and population survey of Morelet's crocodile. Richard R. Montanucci, Steven G. Platt.
  147. Protected areas management plan and database. Bruce and Carolyn Miller.
  148. Conservation and ecology of American crocodiles. Steven G. Platt, John Thorbjarnarson.
  149. Middle Cay Research Station/Glovers Reef Reserve manage-
- BOLIVIA
150. Ungulate research and training. Andrew Taber and Fundación Amigos de la Naturaleza.
  151. Abundance, distribution, and habitat use of crocodilians in Beni. Lius F. Pacheco.
  152. Alto Madidi National Park management planning. Rosamaria Ruiz/EcoBolivia.
  153. Status of blue-throated macaw, Charles Munn.
  154. Effects of logging on ungulates and white-lipped peccary behavior. Lilian Painter.
  155. Effects of logging on black spider monkeys. Robert Wallace.
  156. Impacts of forestry on wildlife (BOLFOR/WCS/Chemiconics/USAID). Damian Ruiz.
  157. Planning and design of Kaa-Iya del Gran Chaco National Park. Andrew Taber/C.A.B.I. (Capitanía del Alto y Bajo Izozog)/USAID.
  158. Veterinary intervention and monitoring. William Karesh, Robert Wallace, Lilian Painter.
- BRAZIL
159. Flooded forest conservation in Central Amazon, Mamirauá Ecological Reserve. José Márcio Ayres (WCS/WWF/ODA/CNPG/Museu Goeldi).
  160. Fish ecology in Amazonian flooded forests. Helder Queiroz, Ronaldo Barthem, José Márcio Ayres.
  161. Population and ecology studies of crocodilians. Ronis Silveira, John Thorbjarnarson.
  162. Lear's macaw conservation. Pedro Lima, CETREL, Charles Munn.
  163. White-lipped peccary conservation, Maracá Island. José Fragoso.
  164. Frugivores in the Atlantic coast forest. Mauro Galetti.
  165. Vertebrate community structure in western Amazonian forests. Carlos A. Peres.
  166. Frugivore resource use and palm phenology. Kirsten Silvis.
  167. Veterinary intervention and monitoring. Robert Cook, William Karesh, José Fragoso.
- COLOMBIA
168. Student grants program. María Elfi Chaves, FES.
  169. Avian seed dispersers, Central Cordillera. Sandra Arango Caro.
  170. Nesting ecology and sustainable use of Chipiro River turtles. Olga Victoria Castaño.

171. Conservation of the Orinoco crocodile. Myriam Lugo Rugeles.
172. High Andes bird communities. Gustavo Kattan/CARDER.
173. Cloud forest regeneration in Ucumari Regional Reserve. Carolina Murcia/CARDER.
174. Mountain tapir ecology in Ucumari Regional Reserve. Jaime Cavalier/CARDER.
175. Forest falcon ecology in the Chocó. Paul Salaman.
176. Forest fragmentation and bird communities in the Central Cordillera. Luis Miguel Renjifo.

COSTA RICA

177. Kingfisher community in Tortuguero National Park. Angel Canales.
178. Tarpon status. John Dean, William McLarney.
179. Park corridor planning, Tortuguero. Archie Carr III.
180. Conservation genetics of the green sea turtle. Tigerin Pearce.
181. Tropical dry forest rehabilitation and conservation. Marc Lapin.
182. Habitat selection of Baird's tapir, Corcovado National Park. Charles Foerster.
183. Creation of wildlife habitat. Lynn Carpenter, Mario Cordero.
184. Ecotourism and riparian corridors, Sarapiquí River. Federico Paredes.
185. Monitoring indicator bird species and habitat. Theodore Simons.
186. Great green macaw habitat requirements. George Powell, Robin Bjork.
187. Conservation implications of agricultural windbreaks. Karen Nielsen, Debra De Rosier/Monteverde League.
188. Central American Corridor Planning. Mario Boza/GTZ/CCAD.

DOMINICAN REPUBLIC

189. Population ecology and conservation of American crocodiles. Andreas Schubert.

ECUADOR

190. Mountain tapir ecology and conservation. Craig Downer.
191. Sustainable Use of Biological Resources Project (WCS/US-AID/CARE/). Jody Stallings, Alejandro Grajal, EcoCiencia.
192. Tropical Andes biodiversity monitoring and training. EcoCiencia
193. Wildlife ecology training. Peter Feinsinger, Marty Crump.
194. Genetic analysis of Galápagos



*Rosamaria Ruiz scales a cliff in Bolivia's recently declared Madidi National Park to examine the nests of red-and-green macaws.*

- tortoises. Edward Louis.
- EL SALVADOR
195. Field ornithology training workshops. Oliver Komar.
- GUATEMALA
196. Wildlife monitoring in Tikal National Park. Howard

- Quigley, Milton Cabrera, Maria José
197. Conservation of seagrass bed fishes and macroinvertebrates on the Atlantic Coast. Alejandro Arrivillaga.
  198. Herpetofauna of Caribbean

- rain forests. Eric Nelson Smith Urrutia.
199. Primate survey. Johanna Motta Gill, Gilberto Silva-López, Alonso Sánchez-Hernández.
  200. Tikal National Park management plan and interpretation.

Jim Barborak.

201. Secondary succession in abandoned farms, Maya Biosphere Reserve. Patricia Orantes.

#### GUYANA

202. Impact of gold-mining on fish communities. Godfrey Bourne.

#### HONDURAS

203. La Muralla National Park resource inventory management planning. Archie Carr III, James Barborak, Sergio Midence.
204. Strengthening of the COHDEFOR wildlands. Archie Carr III, James Barborak.

#### MEXICO

205. Interactions between jaguars and pumas: Conservation planning, Cuixmala Reserve. Brian Miller.
206. Monarch butterflies. Alfonso Alonso, Lincoln Brower.
207. Forest fragmentation and bat communities. Michelle Evelyn.
208. Carnivore and small mammal community study, Cuixmala Reserve. Brian Miller.

#### NICARAGUA

209. Green turtle population, Miskito Coast. Cynthia J. Laguerre.
210. Role of frugivorous birds in long-term conservation. Juan Carlos Martinez Sanchez.
211. Atlantic forest corridor planning. Archie Carr III, James Barborak, Mario Boza, GEF, World Bank.

#### PANAMA

212. Marine turtle ecology. Anne Meylan, Peter Meylan.
213. Wildlife use and park management. Julieta Samudio.
214. Buffer zone systems. Richard Condit.
215. Land and the indigenous people of eastern Panama. Peter Herlihy.
216. Medicinal plants and orientation manual. Rutilio Paredes Martinez.

#### PERU

217. Coastal wildlife conservation at Punta San Juan. Patricia Majluf.
218. Fisheries and marine mammal conflicts. Patricia Majluf, Cecilia Rivas.
219. Conservation education in fishing communities. Cecilia Rivas.
220. Humboldt penguin ecology. Carlos Zalavaga, Rosana Paredes.
221. Macaw ecology and conservation. Charles Munn.
222. Community-based conservation. Charles Munn.
223. Land tenure and legislation in buffer zones. CEDIA, Charles Munn.
224. Veterinary intervention and

monitoring. William Karesh, Mark Stetter, Patricia Majluf, Neil Grimmell, Rosana Paredes, Carlos Zavalaga.

#### VENEZUELA

225. Rio Nichare rain-forest conservation. Philip Desenne, ACOANA.
226. Henri Pittier National Park bird monitoring. Miguel Lentino, Sociedad Conservacionista Audubon, Phelps, Ornithology Collection.
227. Student grants program. Isabel Novo, EcoNatura.
228. Parrot trade and conservation. Philip Desenne.
229. Orinoco crocodile conservation. John Thorbjarnarson, Gustavo Hernandez, FUDENA.
230. Habitat sustainability of Orinoco crocodiles. Andreas E. Scijas.
231. Jaguar ecology and conservation. Rafael Hoogesteijn, Mel Sunquist, Hato Piñero.
232. Anaconda ecology. Jesús Rivas, María Muñoz, John Thorbjarnarson, Paul Calle, PROFAUNA.
233. National parks management and training. EcoNatura, WCS/Inparques/EC.
234. Timber extraction and biodiversity corridors. José Ochoa.
235. Fish diversity in the Caura River. Donald Taphorn, Conrad Vispo, UNELLEZ.
236. Hunter education around national parks. José Lorenzo Silva.
237. Bird conservation in managed tropical forests. Douglas Mason.
238. Integration strategy for biodiversity management. José Ochoa/ACOAN/CIDIAT/MARNR/ Fundación Pola.
239. Yellow-shouldered Amazon genetics, ecology, and conservation. Franklin Rojas-Suarez, PROVITA, Virginia Sanz, George Amato, Alejandro Grajal, William Karesh.
240. Tegu lizard ecology. Angela Schmitz, UNELLEZ.
241. Cebus monkey biology and genetics. Ximena Valderrama.
242. Demographics and habitat of the great tinamou. Conrad Vispo.
243. Ethnoecology of the Ye'Kuana Indians. Claudia Knab.
244. Venezuela Red Data Book. Jon Paul Rodriguez, Franklin Rojas, PROVITA, Fundación Pola.
245. River turtle ecology and management. Tibisay Escalona.
246. Margarita parrot release program. William Karesh, Almira Hoogesteijn, PROVITA.

#### REGIONAL

247. Paseo Pantera Cooperative Program (WCS/CCC/USAID). Archie Carr III, James Barborak, Kathleen Jepson.
248. South America training coordination, Maria Elfi Chaves, Alejandro Grajal, Stuart Strahl.
249. Nutritional analyses of food composition for Latin American mammals, birds, and reptiles. Ellen Dierenfeld, Scott Silver, Cary Yeager, Fred Koontz, Paul Cale, John Thorbjarnarson, William Karesh, Bob Cook.
250. Mesoamerica biological corridor regional planning. Mario Boza, Archie Carr III, CCAD.
251. Genetic division in wild populations of caiman, Amazon Basin. George Amato, William Karesh.

#### NORTH AMERICA

252. Moose biology with and without grizzly and wolf predation in temperate and subarctic North America. Joel Berger, Carol Cunningham, Peter Stacey.
253. Avian indicators and ecosystem management in the Pacific West. Steve Zack.
254. Environmental impacts on desert fishes of the southwestern U.S. and northern Mexico. Paul Loiselle.
255. Beaver: Keystone architect of the Adirondacks. Peter Houlihan.
256. Ecological and management implications of a large-scale forest blow-down in the Adirondacks, Jerry Jenkins.
257. Logging impacts on wildlife. Rob and Cheryl Fimbel.
258. Oswegatchie cooperative stewardship initiative. Bill Weber, Jerry Jenkins, Angie Hodgson.
259. Mesocarnivore research priorities in New England and eastern Canada. Todd Fuller, John Organ, Bill Weber.
260. GIS assessment of natural wolf recovery, northeast U.S. Dan Harrison, Ted Chapin.
261. Monitoring the monarch butterfly migration in eastern North America. Lincoln Brower, Richard Walton, Tonya Van Hook, William Calvert.
262. Great Swamp cooperative conservation program. Michael Klemens, Fred Koontz, Ellie Fries, Donna Fernandes, Dennis Thoney, Paul Loiselle, Ed Spevak.
263. Ecology, ecosystem requirements and conservation of the bog turtle in New England.

Michael Klemens, Alison Whitlock, Julie Victoria.

264. Morphometrics, genetics, ecology, and conservation of spotted and bog turtles in New York. John Behler, Al Breisch, George Amato.
265. A participatory approach to biodiversity conservation and land-use planning in southern New York. Michael Klemens.
266. Meta-population ecology of the bog turtle in the southern Appalachians. Joseph Mitchell, Carola Haas, Shawn Carter.
267. Genetics and conservation, Jefferson's salamander. James Bogart, Michael Klemens.
268. Estuarine ecology of the New York City coastal zone. Betty Borowski.
269. Salt-marsh ecology and pollution studies: Gateway National Seashore, New York. John Tanacredi.
270. Amphibian and reptile restoration at Gateway National Recreation Area, New York. Robert Cook, John Behler, WCS Reptile Staff.
271. Recovery status of grassland birds as a guide for ecologically based management. Fred Koontz, Susan Elbin.
272. Genetics of natural populations of humpback whales. H. Rosenbaum, George Amato.

#### CONSERVATION POLICY PROGRAM

273. Ocean Wildlife Campaign: Conserving and restoring the oceans' large pelagic fishes. Dorene Bolze, Paul Boyle.
274. Asian consumer awareness campaign on the tiger. Dorene Bolze, Carmen Sandoe, Peter Wilken Ogilvy & Mather-Asian Region).
275. U.S. Asian community outreach on threatened wildlife in traditional medicines. Dorene Bolze.
276. CITES and wildlife trade policy. Dorene Bolze, WCS Staff.
277. Turtle conservation sourcebook. Michael Klemens, George Amato, John Behler, Dorene Bolze, Bonnie Raphael, John Thorbjarnarson.
278. Analysis of trade and use: Turtles and tortoises. Michael Klemens, Dorene Bolze, John Thorbjarnarson, John Behler.
279. Sustainable use analysis: Crocodilians. John Thorbjarnarson.
280. Tibetan antelope and trade in Shahtoosh wool. George Schaller, Dorene Bolze, George Amato.

# *the wildlife conservation*



In addition to its work at six facilities in New York City and Georgia, the Wildlife Conservation Society is active on five continents, in field biology and conservation, environmental education, genetics, wildlife nutrition, and veterinary medicine. Currently, this effort encompasses 386 projects and programs in 53 nations around the world, as indicated



# society around the world

on the map below. Another 5 projects deal with worldwide and oceanic problems. These 391 projects are dedicated to saving endangered species, answering human needs and aspirations, developing basic information about ecological systems, and educating present and future generations who will ultimately determine how well our efforts work.



# *funding the future*

*"Our job is to  
save wildlife.  
But . . . saving  
wildlife involves  
people, first  
and foremost."*

DAILEY PATTEE,  
WILDLIFE CRISIS CAMPAIGN  
COMMITTEE CHAIRMAN



It is gratifying to report the end of a fundraising campaign and to thank those who have contributed so much to its success. Facilities are built, programs are launched, a lot of hard work and the spirit of volunteerism are rewarded. But, in a sense, the end of a campaign is also a beginning. It establishes new directions and, inevitably, points to the future, which, in turn, must be served. In no case is this more true than our own. The very subject of the Wildlife Conservation Society's concern is the future. The point is not that we have concluded but that we will continue. Just as there is no end to conservation, there is no end to education or public service—and all are uniquely combined in what the Society is doing today and for future generations.

Which brings us back to the present. The Wildlife Crisis Campaign began in 1990, picked up steam in 1991, was officially announced in 1992, and in 1996, at the end of the Wildlife Conservation Society's centennial year, it reached a hopeful conclusion, exceeding the \$100-million goal. During that time, the private sector, led by our trustees and advisors, provided gifts of more than \$70 million, of which \$25 million was in the form of annual giving. The City of New York, through various agencies, allocated \$30 million to landmark capital projects, including the Congo Gorilla Forest now underway at the Bronx Zoo.

Still, one might ask what actual effect the Campaign has had. Certain projects have been realized and goals achieved, but has there been forward movement by the institution and the people who work for it? The answer must be yes, qualified only because there is so much more to do.

Numbers prove the point.

- ◆ *In 1990*, when the Wildlife Crisis Campaign began, the number of schoolchildren reached in New York by WCS educational programs was less than 1 million. By 1996, there were more than 1.7 million learning about wildlife and the environment from us.
- ◆ *WCS facilities* in New York City went from three in 1990—the Bronx Zoo, the New York Aquarium, and the then recently reopened Central Park Wildlife Center—to five in 1996, with the addition of the redesigned Queens and Prospect Park Wildlife Centers in 1992 and 1993, respectively.
- ◆ *International field projects* numbered 125 in 1990 and have now more than doubled to 285.
- ◆ *One WCS environmental* education curriculum was being used by school systems in 24 states in 1990. There are now four curriculums, ranging from kindergarten through 12th grade, being used in 48 states and 7 nations abroad.
- ◆ *Through WCS efforts* since 1990, more than 100 million acres of protected land has been set aside in parks and reserves around the world, from the Tibetan Plateau to Bolivia.

These changes and many others are part and parcel of the Society's overall growth during the period, and certainly the Wildlife Crisis Campaign had much to do with that growth. The Campaign added Sea Cliffs, a major exhibition-education facility at the Aquarium, and began work on the Congo Gorilla Forest at the Bronx Zoo. African Market was completed at the Zoo and important renovations were carried out at the World of Birds. Overseas, the Campaign's Crisis Fund for Vanishing Wildlife financed major conservation projects in Zaire, Kenya, Central America, Asia, and elsewhere. Chairs and positions were endowed in wildlife health, nutrition, pathology, and environmental education. Teacher training and minority education programs were expanded. And annual operational support grew to embrace many new efforts at home and abroad.

What came out of this process was not a new organization, but one that continues the practices of 100 years with new usefulness and meaning, weaving together the various strands of education, conservation science, and public service. In 1993, the Society's evolving mission produced a new name. The New York Zoological Society, so named at its founding in 1895, became the Wildlife Conservation Society, which not only reflects better what we actually do but also declares our promise to those who care about saving wildlife, wild places, and the heritage we leave our children.

Many people worked hard to make this Campaign a success—trustees, advisors, staff. Members of our National Wildlife Crisis Campaign Leadership Committee included John Elliott, Jr., Frank Y. Larkin, Carl Navarre, Jr., Howard Phipps, Jr., and David T. Schiff. Staff was led throughout by Director for Development and Leadership Gifts Candice K. Frawley, and in the latter stages of the Campaign with Vice President for Public Affairs and Development Jennifer Herring. There has been a new national thrust and the coalescence of the very active Northern California Council in San Francisco, chaired by Helen Spalding and John Goldman. Growth and change, however, have inevitably been accompanied by some areas of disappointment. City funding for all New York cultural institutions, including the Society, continues to decline. Several projects and programs in the Society's long-range planning for the future remain to be funded. These include environmental education initiatives for local, national, and international schools; endowments for curatorial chairs and other positions; the redesign of older buildings for innovative uses in education and conservation; the creation of new living habitats and breeding programs for species threatened in the wild; and the support of long-term conservation strategies around the world. With continuing campaigns, they must and will be financed.

As Brooke Astor once remarked, the Society is one of New York City's crown jewels, one of several indispensable cultural institutions founded in the late 19th century and still going strong. The Society's zoos and aquarium serve 8 million New Yorkers and another 12 million plus in the tri-state area. We provide the only contact that most of our audience has with living wild nature. Our wildlife sanctuaries are oases of learning that improve the quality of life for city and suburban dwellers alike. We create and run innovative environmental education programs and curriculums that reach every school district in the metropolitan area and most of the United States.

Our work is, by definition, about the future, but it is also, like nature itself, about interdependence. What we do in New York and in this country is integral to what we do globally, and vice versa. Fairfield Osborn, Society president from 1940 to 1968, wrote, "it was never intended that the Zoological Society's interests should be bounded by the fences around the Zoo and Aquarium." Our scientists have worked around the world since the Society's earliest days, but now their task requires greater resources and new levels of cooperation. Anchored in a highly developed urban center, we are linked with the aspirations of people everywhere, and we inevitably face the same ecological problems.

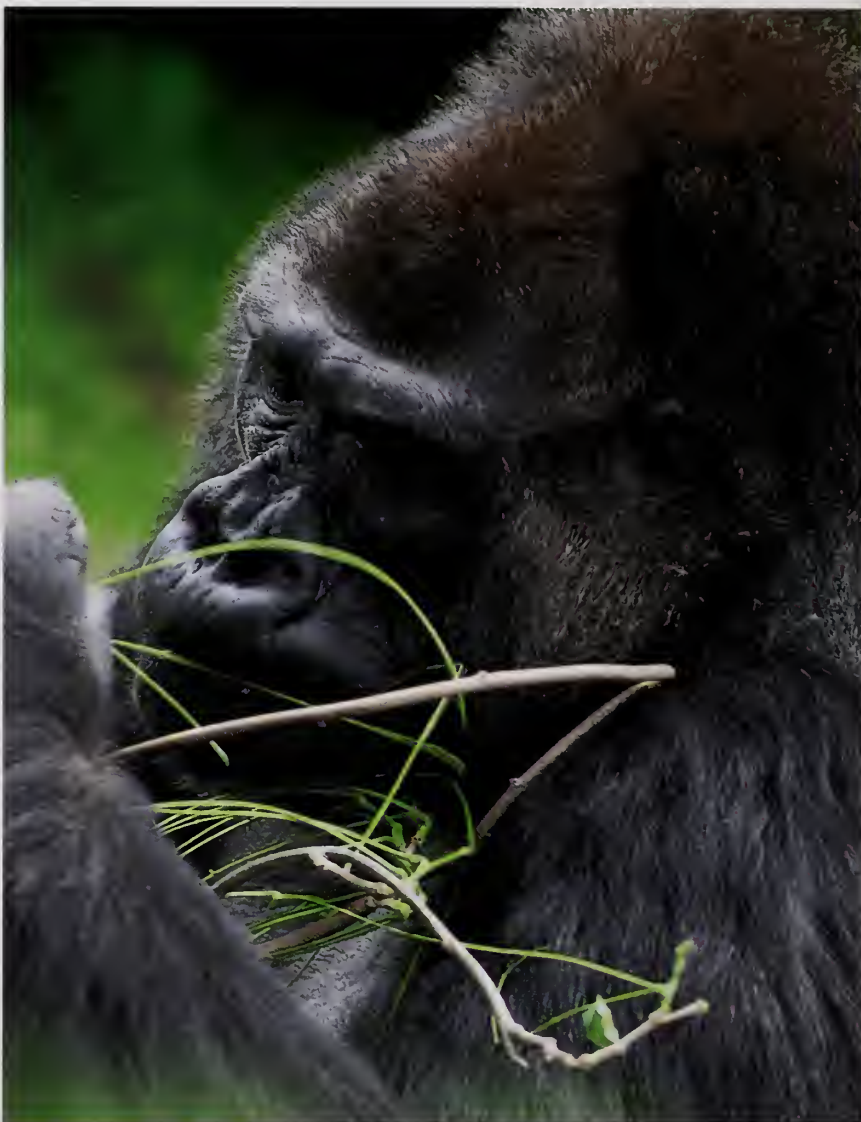
Our job is to save wildlife. But it should be emphasized that saving wildlife involves people, first and foremost. It involves the people who actually work on the front lines, in field science, animal management, education, wildlife health, nutrition, genetics, marine biology, and other disciplines. It involves the millions of people we serve each year who in turn support our parks and programs. It involves communities and agencies in countries, including our own, where decisions must be made about protecting wildlife and the environment. And finally, it means insuring, as WCS Director for Science George Schaller has written, "that future generations will be inheritors, not just survivors."



*From top: Enid Haupt, Howard Phipps, Jr., Laurance S. Rockefeller, and Norma and Charles Dana provided unrestricted leadership gifts for the Campaign.*

## congo gorilla forest

A goal of \$31 million was set by the Wildlife Crisis Campaign for this 6.5-acre exhibition, breeding, and education complex at the Bronx Zoo. Major funders are the Mayor's Office, the City Council, the Bronx Borough President, and several private donors, including Hillside Capital and The Irwin Family, through John N. Irwin II and John N. Irwin III (below). The groundbreakers on October 18 were (bottom, from left) William Conway, Henry Stern, Schuyler Chapin, Alan Hevesi, June Eisland, Peter Vallone, Caroline Atkinson with baby twin gorillas, Howard Phipps, Jr., Fernando Ferrer, and a student from P.S. 205.





*The Congo Gorilla Forest, dedicated to the conservation of African forests, will offer close views of the animals in re-created landscapes (above) and classrooms hidden in the treetops. Major funders include The George F. Baker Trust, through George F. Baker III (left, with William Conway); The Bodman Foundation, through Guy Rutherford (below, with his daughter Leith Talamo); and the Charles Hayden Foundation, through William Wachenfeld (below left). The Wallace Fund, through George V. Grune; ITT, through Rand Araskog; and the Edward John Noble Foundation, through Mr. and Mrs. Frank Y. Larkin, also provided substantial backing for projects at the Bronx Zoo, the Aquarium, and St. Catherine's Wildlife Survival Center.*





## science and education

*The Campaign is funding important projects in international conservation, environmental education, and wildlife health sciences. Edith McBean Newberry (left) supports the Grauer's gorilla survey in Zaire (above left), among other efforts. Dr. Judith Sulzberger (top) provided endowment funds toward the Chair in Wildlife Health Sciences (Dr. Robert Cook, above). And the Homeland Foundation, through E. Lisk Wykoff, Jr. (below left, between John Frawley and WCS Director of Development and leadership Gifts Candice Frawley), established the Chauncey Stillman Chair in Wildlife Education (below, a class at the Bronx Zoo). Other outstanding donors in these areas include Robert W. Wilson, Anne Pattee, and Dailey and Gordon B. Pattee for international conservation, and The Schiff Family, through David T. and Peter G. Schiff, for Wildlife Health Sciences.*



## *Wildlife Crisis Campaign (1990-96)*

The Wildlife Conservation is grateful to the City of New York for its outstanding partnership.

### *GIFTS OF \$3 MILLION AND ABOVE*

Lila Acheson Wallace Fund for the New York Zoological Society  
Howard Phipps Foundation  
Estate of John W. Livermore  
John D. and Catherine T. MacArthur Foundation

### *GIFTS OF \$1 MILLION TO \$2,999,999*

The George F. Baker Trust  
The Bodman Foundation  
Liz Claiborne and Art Ortenberg Foundation  
Mr. and Mrs. Charles A. Dana, Jr.  
Estate of Doris Duke  
Enid A. Haupt  
Charles Hayden Foundation  
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Edward John Noble Foundation  
Estate of George Eustis Paine  
Anne Pattee  
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Estate of Harriet Roeder  
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Mr. and Mrs. Thomas Unterberg

### *GIFTS OF \$100,000 TO \$249,999*

The Achelis Foundation  
BGM Fund in the New York Community Trust  
The Barker Welfare Foundation  
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Helen Cannon  
Guy Cary  
Peggy Catalane  
CITIBANK

Joan and Joseph Cullman  
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The Heckscher Foundation for Children  
The Perkin Fund  
Julian H. Robertson, Jr.  
Samuel and May Rudin Foundation, Inc. and Jack and Susan Rudin  
The Thorne Foundation

### *GIFTS OF \$50,000 TO \$99,999*

John and Marcia Goldman Philanthropic Fund  
Estate of Dorothy Hammond  
Manufacturers Hanover Trust  
The Morgan Stanley Foundation, Inc.  
The Rockefeller Group  
Mr. and Mrs. Joseph R. Siphron

### *GIFTS OF \$25,000 TO \$49,999*

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### *GIFTS UP TO \$24,999*

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Mrs. Charles L. Wilson III  
E. Lisk Wyckoff, Jr.  
\* deceased



## *into the second century*

Much of fiscal 1996 fell in the Society's 101st year, and centennial events continued apace. Three of the six centennial lectures, titled "Conservation at the Crossroads," were delivered in the fall and winter at Rockefeller University. "Footsteps Across Africa" brought the centennial celebration to Kenya and Tanzania in February. And the Wildlife Crisis Campaign officially and successfully concluded at the April 22, 1996 Annual Meeting (see pages 46-51). Also at that event, Howard Phipps, Jr. stepped down after 21 momentous years as WCS President and Chairman of the Board, passing the baton to long-time trustee David T. Schiff.



Top: Chairman Emeritus Howard Phipps, Jr. brandishes the "key to the Bronx Zoo" given him by incoming Chairman David T. Schiff after the Annual Meeting at Avery Fisher Hall. Above: Mayor Rudolph Giuliani held his May 16 cabinet meeting at the Bronx Zoo's Keith W. Johnson Zoo Center. Left: Also at Zoo Center, on April 23, the Mayor (right) heard new Chairman David Schiff's presentation of plans for the Congo Gorilla Forest, much of which is funded by the Mayor's Office, the City Council, and the Bronx Borough President.



## SPECIAL OCCASIONS

Left: This year's WCS dinner-dance, Gala 101, was held at the Bronx Zoo on the evening of June 11, 1996 and chaired by Norma Dana (right), her husband Charles, and Eben Pyne (center), here joined by Alicia Winegardner. Below and lower right: Charles W. Russell, Jr., Meaghan Dowling, and Charles Howard chair the Conservation Council, which held its annual evening at the Central Park Wildlife Center on June 20, 1996.

Lower left: Chairman Emeritus Howard Phipps, Jr. entertained the Gala 101 audience with a tune on his favorite instrument, accompanied by bandleader Bob Hardwick.





### THE YOUNG AND ALWAYS YOUNG

Above and right: Young visitors to Purina Big Cats Weekend at the Bronx Zoo pointed out the cheetahs, not Indian elephant Tus and her friend Tim O'Sullivan, who retired after 21 years of outstanding service as the Society's management mediator and deputy director for administrative services.

Below: Three Bosnian boys toured the Bronx Zoo on May 28, 1996, during their trip to the United States, sponsored by Nobody's Children of Windham, N.H., to undergo surgery and receive prosthetic limbs.





## BLIZZARD BUSTERS

*Record snowfall in the winter of 1995-96 made Zoo Center (above) and the Lion House (lower left) more picturesque than ever and brought out the best in the Bronx Zoo's maintenance staff (left), many of whom spent nights in the park clearing paths and removing dangerous ice. Leading the effort were Maintenance Supervisor Raymond Kalmanowitz (below, left), who kept the public areas open, and Animal Commissary Manager George Fielding (below, right), who kept the animals fed.*



## ALL AROUND TOWN

Right: Eric Carle signed copies of his recently reissued book, *The Very Hungry Caterpillar*, for eager young readers at the Bronx Zoo on May 25, 1996.

Below, left: Queens Borough President Claire Schulman and Commissioner of Parks and Recreation Henry Stern celebrated Groundhog Day at Queens Wildlife Center.

Below, right: Throughout June 1996, Doo-wop groups evoked the 1950s, the new Aquarium's founding decade. Bottom: Bronx Zoo events, including the Tropicana Run for Wildlife on April 13, 1996, were organized by event marketer Rachel Drosopoulos, assisted by Jose Serrano.





## footsteps across AFRICA



In eleven different groups—led by WCS scientists and other staff—trustees, supporters and friends of the Society traveled through Kenya and Tanzania from February 16 through 29, when the entire group of 113 participants met in Kenya's Amboseli National Park and then moved on to the new Kimana Wildlife Sanctuary to celebrate the Society's 100th birthday and the investiture of Howard Phipps, Jr. as a Masai elder. Director of the Kenya Wildlife Service David Western and WCS Chairman of Ornithology Donald Bruning (above) were there, as were WCS field scientist Simon Mduma (right, second down), Sam and Emma Pucci (below), and Mt. Kilimanjaro (top).





Indian rhino Dailey, named for Trustee Dailey Pattee, browsing with her mother, Ella, named for the late Ella Fosbay.

## Animal Census (at Dec. 31, 1995)

### BRONX ZOO (WILDLIFE CONSERVATION PARK)

MAMMALS	Species and subspecies	Specimens owned	Births/Hatchings
Marsupialia—Kangaroos, gliders	3	37	0
Insectivora—Hedgehogs, tree shrews	3	19	7
Chiroptera—Bats	6	514	137
Primates—Apes, monkeys, marmosets, etc.	29	177	23
Edentata—Sloths	1	1	0
Lagomorpha—Rabbit	1	1	0
Rodentia—Squirrels, rats, gerbils, porcupines, etc.	36	520	308
Carnivora—Bears, cats, dogs, etc.	20	81	8
Pinnipedia—Sea lions	1	5	0
Proboscidea—Elephants	1	7	0
Hyracoidea—Hyraxes	1	15	14
Perissodactyla—Horses, rhinos, etc.	5	46	1
Artiodactyla—Cattle, sheep, deer, antelope, etc.	26	419	55
Totals	133	1,842	553

### BIRDS

Struthioniformes—Ostriches	1	2	0
Rheiformes—Rheas	1	1	0
Casuariiformes—Cassowaries, emu	3	5	0

Sphenisciformes—Penguins	1	3	0
Pelicaniformes—Pelicans, cormorants, etc.	4	19	0
Ciconiiformes—Herons, storks, flamingos, etc.	13	112	2
Anseriformes—Swans, ducks, geese, screamers	39	293	17
Falconiformes—Vultures, eagles	6	11	0
Galliformes—Maleos, curassows, pheasants, etc.	26	115	14
Gruiformes—Cranes, rails, etc.	13	61	0
Charadriiformes—Plovers, gulls, etc.	17	71	6
Columbiformes—Pigeons, doves	14	44	8
Psittaciformes—Parrots	48	115	0
Cuculiformes—Touracos, cuckoos, etc.	5	13	0
Strigiformes—Owls	3	3	0
Caprimulgiformes—Frogmouths	2	4	0
Coraciiformes—Kingfishers, bee-eaters, rollers, hornbills, etc.	14	53	10
Piciformes—Barbets, toucans, woodpeckers	5	5	0
Passeriformes—Perching birds	68	167	6
Totals	284	1,105	63

### REPTILES AND AMPHIBIANS

Chelonia—Turtles	46	411	29
Crocodylia—Alligators, caimans, crocodiles	10	278	1

Squamata (Sauria)—Lizards	27	101	4
Squamata (Serpentes)—Snakes	39	148	5
Caudata—Salamanders	5	8	0
Anura—Frogs, toads	16	102	57
<b>Totals</b>	<b>143</b>	<b>1,048</b>	<b>96</b>

<b>Bronx Zoo Totals</b>	<b>560</b>	<b>3,995</b>	<b>712</b>
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### CHILDREN'S ZOO, BRONX ZOO

MAMMALS	Species and subspecies	Specimens owned	Births/Hatchings
Marsupialia—Wallabies	2	9	1
Insectivora—Hedgehogs	2	6	2
Primates—Lemurs	1	12	2
Edentata—Armadillos	2	3	0
Lagomorpha—Rabbits	1	2	0
Rodentia—Squirrels, rats, beavers, porcupines, etc.	9	36	9
Carnivora—Foxes, otters, etc.	5	9	0
Hyracoidea—Hyrax	1	2	0
Perissodactyla—Horses	2	7	2
Artiodactyla—Goats, sheep, camels, etc.	5	60	2
<b>Totals</b>	<b>30</b>	<b>146</b>	<b>18</b>

BIRDS	Species and subspecies	Specimens owned	Births/Hatchings
Pelecaniformes—Pelicans	1	2	0
Ciconiiformes—Hérons	1	14	13
Anseriformes—Ducks, geese	8	44	0
Falconiformes—Vultures, hawks, etc.	4	7	0
Galliformes—Chickens, bobwhites	2	59	0
Columbiformes—Doves	2	3	0
Psittaciformes—Parrots	14	27	0
Strigiformes—Owls	4	13	0
Caprimulgiformes—Frogmouths	1	1	0
Piciformes—Toucan	1	1	0
Passeriformes—Perching birds	1	1	0
<b>Totals</b>	<b>39</b>	<b>172</b>	<b>13</b>

REPTILES AND AMPHIBIANS	Species and subspecies	Specimens owned	Births/Hatchings
Chelonia—Turtles	8	47	6
Crocodylia—Alligators	1	12	0
Squamata (Sauria)—Lizards	9	34	0
Squamata (Serpentes)—Snakes	7	34	0
Anura—Frogs, toads	2	5	0
<b>Totals</b>	<b>27</b>	<b>132</b>	<b>6</b>

<b>Children's Zoo Census</b>	<b>96</b>	<b>450</b>	<b>37</b>
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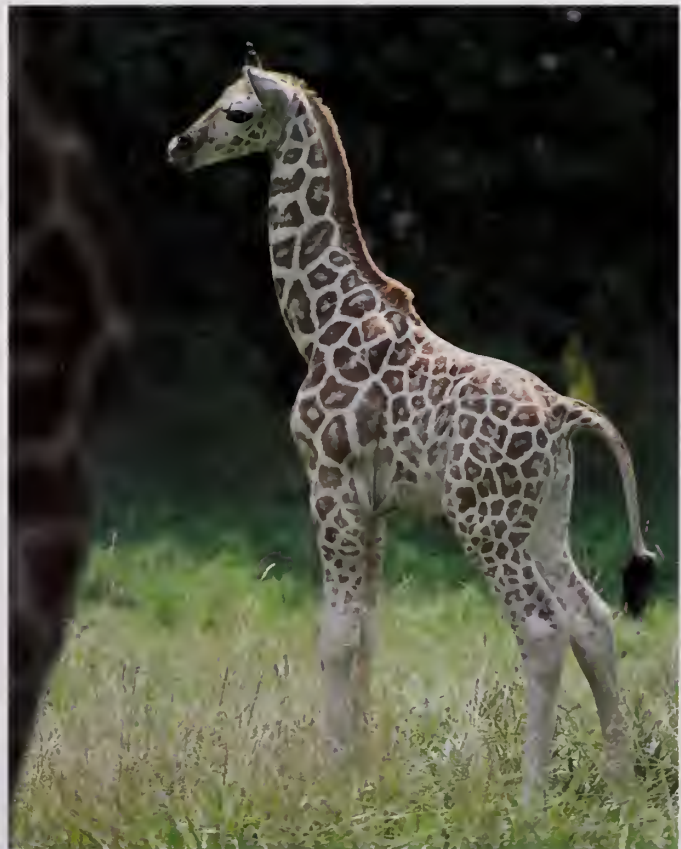
### ST. CATHERINES WILDLIFE SURVIVAL CENTER, GEORGIA

MAMMALS	Species and subspecies	Specimens owned	Births/Hatchings
Primates—Lemurs, macaques	4	62	13
Perissodactyla—Zebras	1	13	0
Artiodactyla—Antelope	8	104	15
<b>Totals</b>	<b>13</b>	<b>179</b>	<b>28</b>

BIRDS	Species and subspecies	Specimens owned	Births/Hatchings
Ciconiiformes—Storks	2	8	0
Galliformes—Pheasants	6	24	3
Gruiformes—Cranes, bustards	10	67	2
Columbiformes—Pigeons	1	1	0
Psittaciformes—Parrots	12	57	2
Coraciiformes—Hornbills	6	16	1
<b>Totals</b>	<b>37</b>	<b>173</b>	<b>8</b>

REPTILES	Species and subspecies	Specimens owned	Births/Hatchings
Testudinata—Turtles	3	104	12
Squamata (Serpentes)—Snakes	1	2	0
<b>Totals</b>	<b>4</b>	<b>106</b>	<b>12</b>

<b>Wildlife Survival Center Census</b>	<b>55</b>	<b>427</b>	<b>55</b>
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*Baringo giraffe James IX, born on July 23 at the Bronx Zoo.*



*Gelada baboon and baby at the Bronx Zoo's Baboon Reserve.*

### CENTRAL PARK WILDLIFE CENTER

MAMMALS	Species and subspecies	Specimens owned	Births/Hatchings
Insectivora—Hedgehogs, shrews	2	2	0
Chiroptera—Bats	2	376	17
Primates—Monkeys	5	17	0
Lagomorpha—Rabbit	1	1	0
Rodentia—Acouchis, squirrels	2	5	0
Carnivora—Bears, otters, pandas	5	10	0
Pinnipedia—Seals, sea lions	1	3	0
Totals	18	414	17

#### BIRDS

Sphenisciformes—Penguins	3	29	3
Anseriformes—Swans, ducks, geese	5	13	0
Galliformes—Partridges, tragopans	3	7	0
Gruiformes—Bitterns	1	2	0
Charadriiformes—Puffins	1	22	4
Columbiformes—Doves, pigeons	2	5	0
Psittaciformes—Parrots	2	10	3
Cuculiformes—Turacos	1	2	0
Coliiformes—Mousebirds	1	2	0
Piciformes—Toucans	1	2	0
Passeriformes—Perching birds	21	69	8
Totals	41	163	18

#### REPTILES AND AMPHIBIANS

Chelonia—Turtles	8	73	0
Crocodylia—Caiman	1	3	0
Squamata Sauria—Lizards	14	200	14
Squamata Serpentes—Snakes	10	34	0
Anura—Toads and frogs	18	256	19
Totals	54	644	64

Central Park Wildlife Center Census 110 1,143 68

### QUEENS WILDLIFE CENTER

MAMMALS	Species and subspecies	Specimens owned	Births/Hatchings
Lagomorpha—Rabbits	1	6	0
Rodentia—Prairie dogs	1	16	0
Carnivora—Pumas, bears, bobcats, coyotes	4	9	0
Pinnipedia—Sea lions	1	4	0
Perissodactyla—Horses	2	2	0
Artiodactyla—Elk, bison, goats, sheep	7	41	0
Totals	16	78	0

#### BIRDS

Ciconiiformes—Egrets	2	15	0
Anseriformes—Ducks, geese	22	178	10
Falconiformes—Eagles	1	1	0
Galliformes—Turkeys	2	10	0
Gruiformes—Cranes	1	2	0
Passeriformes—Perching birds	6	16	0
Totals	34	222	10

#### REPTILES

Chelonia—Turtles	3	38	0
Squamata (Serpentes)—Snakes	2	3	0
Totals	6	41	0

Queens Wildlife Center Census 55 341 10

### PROSPECT PARK WILDLIFE CENTER

MAMMALS	Species and subspecies	Specimens owned	Births/Hatchings
Marsupialia—Wallabies	1	1	0
Primates—Tamarins, baboons	2	7	0
Lagomorpha—Rabbits	1	3	0
Rodentia—Prairie dogs, gerbils, mice, etc.	11	82	58
Carnivora—Pandas, meerkats	3	7	0
Pinnipedia—Sea lions	1	3	0
Hyracoidea—Hyrax	1	5	0
Artiodactyla—Cows, goats, sheep	4	9	0
Totals	24	117	58

#### BIRDS

Casuariiformes—Emu	1	2	0
Ciconiiformes—Hérons	1	8	0
Anseriformes—Geese, ducks	2	4	0
Falconiformes—Eagles	1	1	0
Galliformes—Bobwhites, pheasants, etc.	2	13	0
Columbiformes—Doves	2	6	0

Psittaciformes—Parrots	4	13	0
Strigiformes—Owls	1	2	0
Passeriformes—Perching birds	4	22	0
<b>Totals</b>	<b>18</b>	<b>71</b>	<b>0</b>

## REPTILES AND AMPHIBIANS

Chelonia—Turtles	8	44	0
Squamata Sauria—Lizards	5	36	8
Squamata Serpentes—Snakes	4	6	0
Anura—Frogs	14	83	0
<b>Totals</b>	<b>31</b>	<b>169</b>	<b>8</b>

<b>Prospect Park Wildlife Center Census</b>	<b>73</b>	<b>357</b>	<b>66</b>
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## AQUARIUM FOR WILDLIFE CONSERVATION

## MARINE MAMMALS

	Species	Specimens
Pinnipedia—Seals, sea lions, walrus	5	21
Carnivora—Sea otters	1	4
Cetacea—Whales, dolphins	2	9
<b>Totals</b>	<b>8</b>	<b>34</b>

## BIRDS

Sphenisciformes—Penguins	1	38
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## REPTILES

Chelonia—Sea turtles	7	15
Crocodylia—Caiman	1	3
<b>Totals</b>	<b>8</b>	<b>18</b>

## AMPHIBIANS

Amphibia	3	8
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## CARTILAGINOUS FISHES (CHONDRICHTHYES)

Heterodontiformes—Horn shark	1	1
Lamniformes—Mackerel sharks	1	10
Carcharhiniformes—Ground sharks	7	20
Orectolobiformes—Carpet sharks	2	4
Rajiformes—Rays, skates	9	68
<b>Totals</b>	<b>20</b>	<b>103</b>

## BONY FISHES (OSTEICHTHYES)

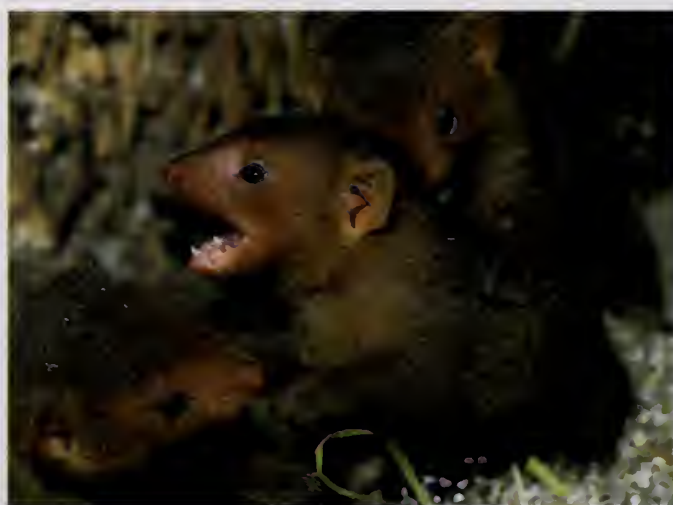
Lepidosireniformes—Lungfishes	1	2
Acipenseriformes—Sturgeons	1	7
Elopiformes—Tarpon, bonefish	1	3
Anguilliformes—Eels, morays	2	5
Osteoglossiformes—Bony tongues	2	13
Mormyriiformes—Mormyids	4	15
Clupeiformes—Herring	1	1
Salmoniformes—Trouts	2	105

Cypriniformes—Minnows, carp	4	11
Siluriformes—Catfishes	4	7
Gymnotiformes—Knifefish	2	8
Batrachoidiformes—Toadfish	2	13
Gadiformes—Codfish	2	7
Mugiliformes—Mullet	1	5
Beloniformes—Needlefish	1	1
Cyprinodontiformes—Swordtails, killifish	6	100
Characiformes—Tetras, piranhas	14	163
Scorpaeniformes—Rockfish, stonefish	11	25
Gymnotiformes—Knifefish	4	22
Atheriniformes—Silversides	5	1,022
Beryciformes—Squirrelfishes, flashlight fish	2	27
Gasterosteiformes—Seahorses, pipefish	5	22
Perciformes—Perches, sea basses, porgies, cichlids, tang, clownfish, butterfly, angelfish, wrasse, chromis, parrotfish, batfish, grouper, cardinal, damsel, flagtail goby, anthius	141	1,418
Pleuronectiformes—Flatfishes	3	18
Tetraodontiformes—Puffers, boxfish, triggerfish, filefish	3	5
<b>Totals</b>	<b>226</b>	<b>3,014</b>

## INVERTEBRATES

Cnidaria—Corals, anemones, jellyfish	70	4,000
Arthropoda—Lobsters, shrimps, crabs	5	10
Mollusca—Snails, bivalves, octopus	13	270
Echinodermata—Starfish, sea urchins	8	23
<b>Totals</b>	<b>96</b>	<b>4,303</b>

<b>Aquarium Census</b>	<b>362</b>	<b>7,518</b>
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Baby dwarf mongooses in the MouseHouse.

# treasurer's report

OPERATING EXPENDITURES exceeded operating revenues by \$744,000. Fortunately, this was better than originally forecast when the fiscal year began on July 1, 1995. At that time the Society was wrestling with a \$1.5 million deficit. Better than expected contributor support halved this number.

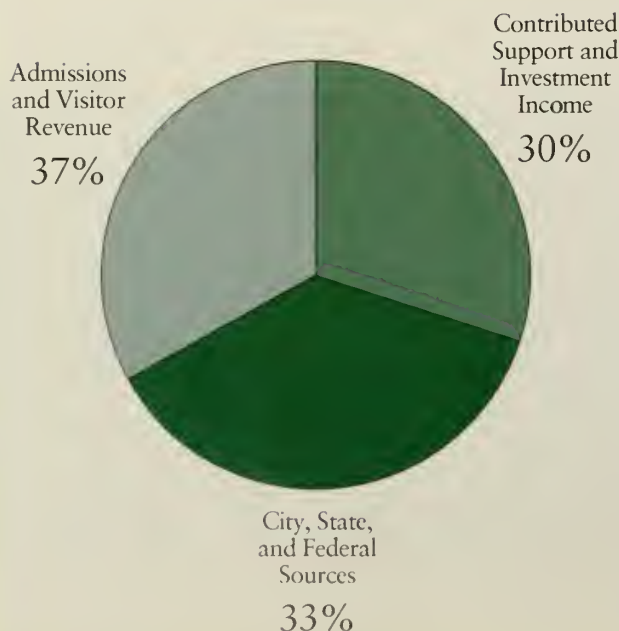
Contributor support and investment income provided 30 percent of operating revenues. City, State, and Federal agencies provided 33 percent, and earned income provided 37 percent. Earned income amounted to \$30 million, of which \$24 million came from visitor related revenues. Nearly four million visits were made to the Society's five New York facilities, more than half of them to the Bronx Zoo. Program service costs represented 86 percent of operating expenditures. Management, membership, and fund-raising costs accounted for the balance.

Expenditures for exhibit improvements were \$8.5 million. Major improvement projects in progress included the Congo Gorilla Forest and the Russell B. Aitken Sea Bird Colony at the Bronx Zoo, and a new Children's Zoo at the Central Park Wildlife Center.

At June 30, 1996 endowment and funds functioning as endowment totaled \$117 million. The total return on these funds for the year ended June 30, 1996 was 19 percent.

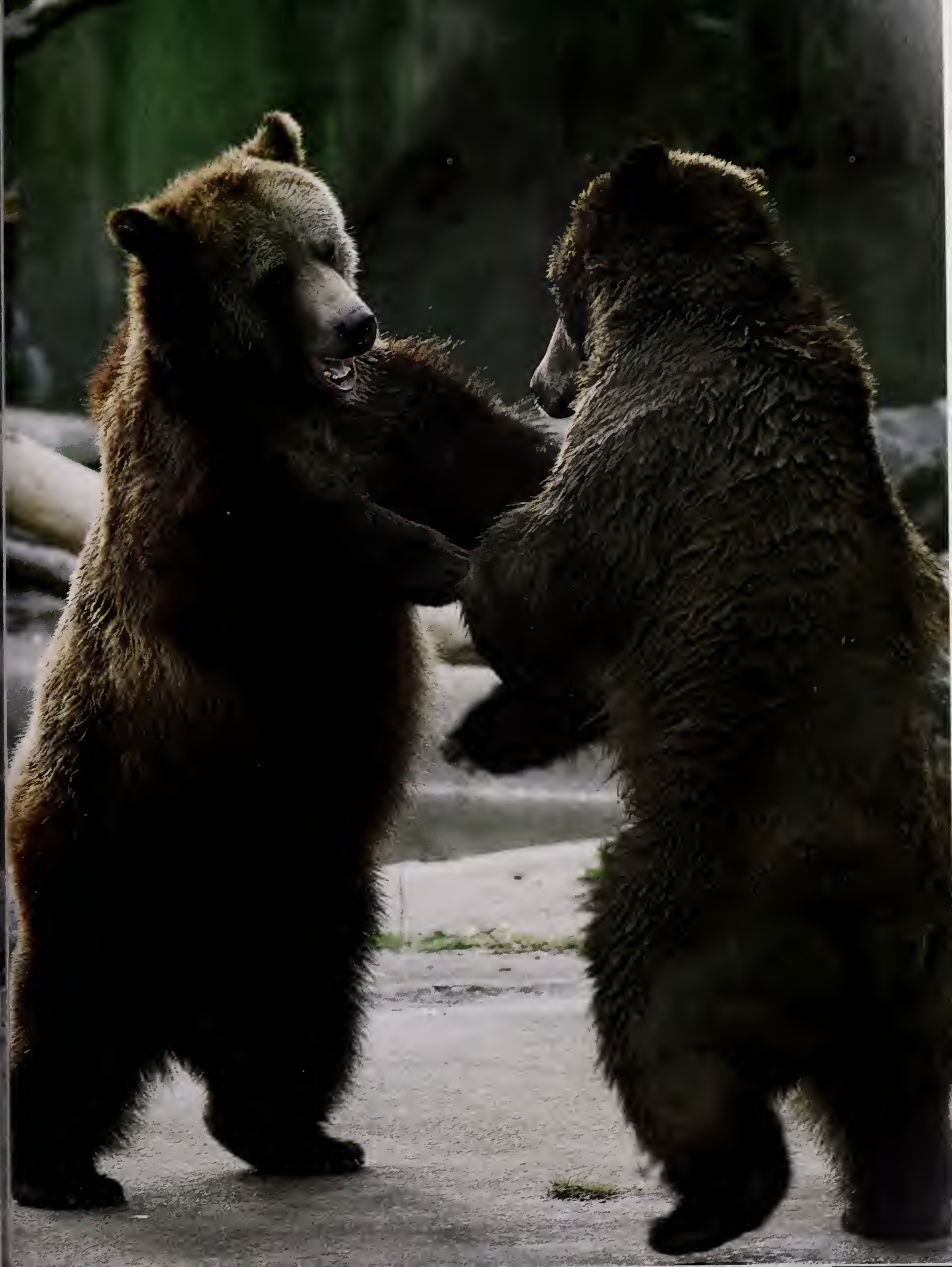
Opposite page: Two of the four grizzly bears rescued in Wyoming and Montana enjoy a friendly fight in their new home at the Bronx Zoo's Big Bear exhibition.

## REVENUES



## EXPENDITURES





## OPERATING REVENUES

*Year ending June 30, 1996*

### REVENUE

Contributions and Fundraising Events	\$8,550,765
Wallace Fund	5,071,125
City of New York	19,531,907
State of New York	1,647,735
Federal Sources	2,311,842
Program Grants	923,582
Admission Fees	8,587,582
Exhibit Admissions	2,446,845
Guest Services	10,937,454
Membership Dues	2,887,803
Investment Income	4,833,263
Publications	1,884,535
Education Program Fees	1,638,448
Miscellaneous	<u>740,749</u>
Total Operating Revenue	<u>\$71,993,635</u>

*A copy of the audited financial statements is available upon request.*

## OPERATING EXPENSES

Year ending June 30, 1996

### OPERATING EXPENSES

#### Program Services

Bronx Zoo/Wildlife Conservation Park	\$33,394,580
Aquarium for Wildlife Conservation	8,791,014
City Wildlife Centers	10,186,925
International Programs	8,656,152
<i>Wildlife Conservation magazine</i>	<u>1,698,300</u>
 Total Program Services	 <u>\$62,726,971</u>

### SUPPORTING SERVICES

Management and General	5,260,012
Membership Activities	1,631,991
Fundraising	2,858,952
Centennial Program	260,145
 Total Supporting Services	 <u>\$10,011,100</u>
 Total Operating Expenses	 <u>\$72,738,071</u>
 Operating Deficit	 \$(744,436)

# Contributions, Pledges, and Payments on Pledges of \$1,000 and More

(July 1, 1995 to June 30, 1996)

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of \$1 million or more)

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In the Butterfly Zone, Vice President for Public Affairs Jennifer Herring entertains a butterfly, Phyllis Dodge of the Cleveland H. Dodge Foundation (right center), and President William Conway (right).

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Associate Veterinarian Dr. Mark Stetter with a young fur seal during health monitoring project in Peru.

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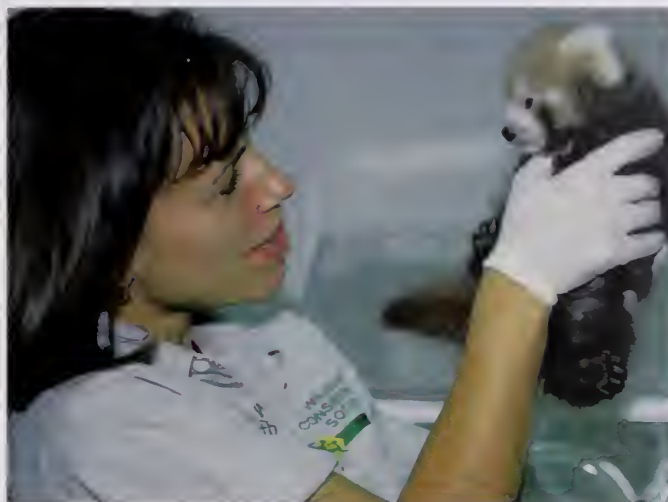
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## Articles and Books by WCS Staff and Associates

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*the society* was founded in 1895 as the New York Zoological Society and chartered in the State of New York on April 26 of that year "to establish and maintain in said city a zoological garden for the purpose of encouraging and advancing the study of zoology, original researches in the same and kindred subjects, and of furnishing instruction and recreation to the people." The 265-acre New York Zoological Park (Bronx Zoo) opened to the public on November 8, 1899, built and then maintained with funds provided by the City of New York and private citizens. The Society assumed operation of the New York Aquarium in Battery Park in 1902, the Central Park Wildlife Center in 1988, the Queens Wildlife Center in 1992, and the Prospect Park Wildlife Center in 1993. The present Aquarium for Wildlife Conservation was opened in Brooklyn in 1957.

In 1897, the Society sponsored its first field project, a study of wildlife in Alaska and British Columbia. Since then the Society has helped establish more than 115 wildlife parks and reserves around the world, and we now conduct 285 field conservation projects in 51 nations. The world's first zoo animal hospital was built at the Bronx Zoo in 1916 and the first formal zoo education department was organized at the Zoo in 1929. This program now reaches more than 2.3 million schoolchildren in the New York metropolitan area and school systems in 48 states and several nations abroad.

#### OPERATING EXPENSES

Bronx Zoo	\$33,394,580
Aquarium for	
Wildlife Conservation	8,791,014
Wildlife Centers	10,186,925
International Conservation	8,656,152
Total Society	\$72,738,071

#### ATTENDANCE AT WCS FACILITIES

Bronx Zoo	2,056,114
JungleWorld	557,836
Children's Zoo	419,855
World of Reptiles	678,238
World of Darkness	669,528
Zoo Shuttle	280,968
Bengali Express	471,607
Skyfari	369,264
Camel Rides	82,418
Aquarium for	
Wildlife Conservation	782,540
Central Park Wildlife Center	755,972
Queens Wildlife Center	185,132
Prospect Park Wildlife Center	213,290
Total WCS Attendance	3,993,048

#### ENVIRONMENTAL EDUCATION

Overall Attendance in Paid	
and Free Programs	2,300,151
Bronx Zoo	
Students in Organized Groups	409,371
Course Enrollment	39,333
Friends of Wildlife Conservation	306
Aquarium for Wildlife Conservation	
Students in Organized Groups	252,208
Course Enrollment	27,510
Volunteers and Interns	250
Central Park Wildlife Center	
Students in Organized Groups	82,533
Course Enrollment	27,510
Participation in Free Programs	512,340
Volunteers	120
Queens Wildlife Center	
Students in Organized Groups	32,071
Course Enrollment	7,325
Participation in Free Programs	82,815
Volunteers	72
Prospect Park Wildlife Center	
Students in Organized Groups	42,384
Course Enrollment	8,763
Participation in Free Programs	209,757
Volunteers	40

#### MEMBERSHIP AND MAGAZINE

Members	
Metropolitan Area	62,975
National	17,000
Wildlife Conservation magazine	
Circulation	150,073

#### ANIMAL CENSUSES

Bronx Zoo	3,995 animals of 560 species
Children's Zoo, Bronx Zoo	450 animals of 96 species
Aquarium for Wildlife Conservation	7,518 animals of 362 species
St. Catherines Wildlife Survival Center	427 animals of 55 species
Central Park Wildlife Center	1,143 animals of 110 species
Queens Wildlife Center	341 animals of 55 species
Prospect Park Wildlife Center	357 animals of 73 species
Total WCS Census	14,231 animals of 1,311 species

#### BIRTHS AND HATCHINGS

Bronx Zoo	712
Bronx Zoo Children's Zoo	37
St. Catherines Wildlife Survival Center	55
Central Park Wildlife Center	68
Queens Wildlife Park	10
Prospect Park Wildlife Center	66

#### LEADERSHIP POSITIONS IN WILDLIFE CONSERVATION

Curators, keepers, field biologists, veterinarians, and other scientists of the Wildlife Conservation Society participate widely in the collaborative wildlife conservation efforts of the American Zoo and Aquarium Association (AZA), which represents 167 accredited zoos and aquariums in North America, and the World Conservation Union (IUCN), a global network of governmental and non-governmental conservation organizations.

Below are listed Society staff who serve as officers in the work being performed by the AZA and the IUCN.

*American Zoo and Aquarium Association (AZA)*  
Field Conservation Committee: William Conway, Chairman.

*Species Survival Plan (SSP) Coordinators:* Babirusa, Penny Kalk; Lowland gorilla, Dan Wharton; Asian wild horse, Patrick Thomas; Snow leopard, Dan Wharton; Sumatran rhinoceros, James G. Doherty; Cranes, Christine Sheppard; Great hornbill, Christine Sheppard; St. Vincent's Amazon, Don Bruning; Congo peafowl, Don Bruning; Mauritius pink pigeon, Kurt Hundgen; Chinese alligator, John Behler; Radiated tortoise, William Holmstrom.

*North American Studbook Keepers:* Lowland gorilla, Dan Wharton; African pygmy goose, Douglas Piekarz; Scarlet ibis, Anna Marie Lyles; Waldrapp ibis, Susan Elbin; St. Vincent's Amazon, Don Bruning; Mauritius pink pigeon, Kurt Hundgen; Common anaconda, William Holmstrom; Radiated tortoise, William Holmstrom; Indian black-pond turtle, William Holmstrom; Beluga whale, Louis Garibaldi.

*International Studbook Keepers:* White-naped crane, Christine Sheppard; Mountain peacock pheasant, Don Bruning; Malayan peacock pheasant, Don Bruning; Hornbills, Wendy Worth; Chinese alligator, John Behler.

*Taxon Advisory Group (TAG) Chairmen or Co-Chairmen:* Cervids/Tragulids, James G. Doherty; Old World monkeys, Fred Koontz; Ciconiiformes, Anna Marie Lyles and Sharon Reilly; Coraciiformes, Christine Sheppard and Wendy Worth; Galliformes, Don Bruning and Christine Sheppard; Parrots, Don Bruning; Crocodilians, Peter Brazaitis; Freshwater fishes, Paul Loisele.

*Scientific Advisory Groups (SAG):* Systematics, George Amato.

*AZA Nutritional Advisory Group.* Executive Committee: Ellen Dierenfeld,

*AZA Small Population Management Advisory Group.* Advisors: Fred Koontz, Edward Spevak

#### *The World Conservation Union (IUCN)*

*Advisory Group of the Sustainable Use Initiative:* John Robinson, Chairman.

*Steering Committee of the Species Survival Commission:* John Robinson.

*Equid Specialist Group:* Patricia Moehlan, Chairman.  
*Pigs and Peccaries Specialist Group:* Andrew Taber, Deputy Chairman.

*Hornbill Specialist Group:* Christine Sheppard, Secretary.  
*Tortoise and Freshwater Turtle Specialist Group:* John Behler, Chairman; Michael Klemens, Action Plan Director.



*Royal and Cayenne terns at Punta León, Argentina.*

EDITOR: Donald Goddard  
DESIGN: Julie Larsen Maher

WORLD MAP: Fernando Camacho  
PREPRESS: Four Lakes Colorgraphics  
PRINTER: BSC Litho  
PAPER: Printed on Gleneagle Osprey—  
a recycled, chlorine-free and  
acid-free paper.

A copy of this annual report may be obtained by writing to the New York Department of State, Office of Charities Registration, 162 Washington Avenue, Albany, New York 12231, or to the Wildlife Conservation Society, Office of the Chairman, Bronx Zoo, New York 10460.

PHOTOGRAPHY: John L. Behler, 57 (lower right); Annette Berkovits, 21, 22 (right), 23 (above); Don Bruning, 57 (top); Tom Butynski, 30 (left); Christa Conway, 7; William Conway, cover, 1, 13, 30 (top), 32 (right), 47 (third from top), inside back cover; Robert Cook, 20, 32 (above), 50 (top and above), 57 (above, below, top right, and right second down), 70; David J. Cox, 50 (above left); Tim Davis, 27 (lion cover photo); Dennis DeMello, Wildlife Conservation Society, 5, 8, 9, 10, 11 (top 2), 12 (right), 16, 17 (above), 22 (below), 23 (below), 24 (above), 48 (3), 49 (above), 50 (below), 52 (left), 54 (right), 55 (4), 59, 60, 61, 63, 66, 73, 77; Gordon Douglas, 37 (2); Susan Farley/NYT Pictures, 54 (below); Donna Fernandes, 26 (top); Alejandro Grajal, 33 (right); Chris Hildreth, 40; Mary Hilliard, 14 (right), 17 (left), 47 (top and bottom), 49 (left), 53 (left and lower left); Merryl Kafka, 24 (right); William Karesh, 74; Margaret Kinnaird, 34 (right); Lisa Kohler, 11 (lower left); Richard Lattis, 3, 57 (right third down); Luiz Claudio Marigo, 28, 29, 42; Mia Matheson, 18, 47 (second from top), 49 (below), 52 (top), 53 (below and lower right); Tim McClanahan, 31 (2); James McGoon, 14 (above); Geoffrey Mellor, 50 (left); Penny Miller, 46; Richard Miller, 25; Tim O'Brien, 34 (above); Alison O'Dowd, 56 (right); Diana O'Halloran, 56 (bottom); Frank Olinski, 23 (left); Richard Parnell, 30 (left); V. Krishna Prasad, 36; Queens Borough President's Office, 56 (below left); Julie Robinson, 33 (above and below); Richard Ruggiero, 39; George Schaller, 35 (above); Michael Schwartz, 12 (below), 52 (above), 54 (above), 58, back cover; Diane Shapiro, 15, 26 (above); Barbara Singer, 19; Star Black, 50 (below left); John Weaver, 38.

#### RECOMMENDED FORM OF BEQUEST

The trustees of the Society recommend that for estate planning purposes, members and friends consider the following language for use in their wills: "To the New York Zoological Society, a not-for-profit, tax-exempt membership organization incorporated in the State of New York in 1895, having as its principal address the New York Zoological Park, Bronx, New York 10460, I hereby give and bequeath for the Society's general purposes."

In order to help the Society avoid future administration costs, it is suggested that the following paragraph be added to any restrictions that are imposed on a bequest: "If at some future time, in the judgment of the Trustees of the New York Zoological Society, it is no longer practical to use the income or principal of this bequest for the purposes intended, the Trustees have the right to use the income or principal for whatever purposes they deem necessary and most closely in accord with the intent described herein."

If you wish to discuss the language of your bequest with a member of the Society's staff, please be in touch with the Chairman's office (212) 220-5115.

David T. Schiff  
Chairman of the Board of Trustees



## Wildlife Conservation Society

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*<http://www.wcs.org>*